DEPARTMENT OF COMMERCE
BUREAU OF STANDARDS
S. W. STRATTON, DIRECTOR

MISCELLANEOUS PUBLICATIONS—No. 48

Weights and Measures

Fourteenth Annual Conference

OF REPRESENTATIVES FROM VARIOUS STATES
HELD AT THE BUREAU OF STANDARDS
WASHINGTON, D. C., MAY 23, 24, 25, AND 26, 1921

PRICE, 20 CENTS
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GOVERNMENT PRINTING OFFICE
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REPORT OF THE FOURTEENTH ANNUAL CONFERENCE ON WEIGHTS AND MEASURES OF THE UNITED STATES.

HELD AT THE BUREAU OF STANDARDS, WASHINGTON, D. C., MAY 23–26, 1921.

FOREWORD.

On account of the urgent need for economy in the expenditure of Government funds it has been found necessary to abridge this report in many respects. To this end the material has been carefully studied to determine what portions might be deleted with the least sacrifice of essential matter. As a result of this examination the proceedings of the first two sessions have largely been abstracted or deleted, and the discussion in all other sessions has been curtailed in every case where it was believed that this could be done without too great loss of material of permanent usefulness to weights and measures officials and others.

The carrying out of this decision has, among other things, resulted in the abstracting of the reports of State delegates and the elimination of the reports of city delegates. It should be understood that the Bureau of Standards is not of the opinion that this material is not of interest and value. It is felt only that this matter can, perhaps, better be spared than discussions resulting in the adoption of some specific proposal, such as a model law or specifications and tolerances. The debate leading up to adoption of decisions of such a character is always of value as showing the information upon which the action was taken and the necessity of the final material, and is sometimes very necessary also for the complete understanding of the matter in question. Furthermore, the reports of State and city delegates are usually issued in printed form by their jurisdictions, and the information given at the conference can, as a rule, be obtained by consulting them.

The bureau hopes that this departure from the usual method of reporting the proceedings of the Annual Conference on Weights and Measures will not be found to impair the general usefulness of the publication.

S. W. Stratton,
Director, Bureau of Standards, and
President, Annual Conference on Weights and Measures.

FIRST SESSION (MORNING OF MONDAY, MAY 23, 1921).

The conference was called to order at 11 o'clock a. m. by Dr. S. W. Stratton, president of the conference and Director of the Bureau of Standards.

ABSTRACT OF ADDRESS OF WELCOME BY THE PRESIDENT, DR. S. W. STRATTON.

Dr. Stratton welcomed the delegates to the Bureau of Standards and recapitulated the objects of the conference for the benefit of new delegates. He touched upon the growing interest in cooperation in weights and measures as evidenced by the volume of correspondence received by the bureau and pointed out the general awakening to the importance of weights and measures regulation and the consequent increase in the duties of the officials. He explained the importance of Federal legislation looking toward the regulation of certain phases of the subject. He emphasized that standards of quantity and quality are of equal importance, and predicted that eventually the functions of weights and measures officials would include both of these. He cited the trend toward the adoption of sales by weight rather than by measure—a method consistently advocated by the conference in the past.

Dr. Stratton urged the interchange of ideas between the official and the manufacturer as the best method of securing an improvement in the weights and measures in commercial use, recommending a general treatment of the problems arising rather than a consideration of any specific device. Finally, he announced with very great regret the serious illness of L. A. Fischer, the chief of the division of weights and measures of the Bureau of Standards and secretary of the conference.

Mr. Holwell. I think before we proceed with our order of business that a motion is in order that this conference express its regret at the illness of its secretary, Mr. Fischer, and that a committee be appointed by the chair to wait upon him and to convey to him an expression of sympathy from the conference.

(The motion was seconded, the question was taken, and the motion was agreed to.)

The Chairman. The Committee will be appointed before the adjournment of this morning's session.

ABSTRACTS OF REPORTS OF STATE DELEGATES.[1]

DISTRICT OF COLUMBIA.

By George M. Roberts, *Superintendent of Weights, Measures, and Markets.*

Mr. Roberts reported the passage of a general weights and measures law to take effect June 3, 1921. Among the outstanding features of

[1] For convenience of reference these reports have been arranged in alphabetical order throughout.

this law may be mentioned the mandatory sale of bread in loaves of specified standard weights and of dry commodities by weight or count or in standard prescribed containers, and the abolition of the fee system.

ILLINOIS.

By WILLIAM F. CLUETT, *Chief Deputy Inspector of Weights and Measures of Chicago.*

Mr. Cluett reported that a bill for a comprehensive weights and measures law in Illinois was pending in the legislature with an excellent prospect of passage. He also gave figures on the work accomplished during the last year by the State superintendent of standards.

INDIANA.

By I. L. MILLER, *State Commissioner of Weights and Measures.*

Mr. Miller gave a brief history of the weights and measures legislation in Indiana and explained the legislative program of the past year, which granted some additional authority to the department. He stated that universal compliance with the recently enacted standard-weight bread law has already been secured.

KANSAS.

By F. E. ROWLAND, *Assistant Chief State Food and Drug Inspector.*

Mr. Rowland reported that the weights and measures work of the department was very greatly hampered by lack of funds, and that comprehensive inspections could not be conducted on that account. A bill providing for the correction of these conditions failed of passage at the last legislature.

KENTUCKY.

By F. REICHMANN, *Official Representative of Kentucky.*

Mr. Reichmann reported that the State had no proper weights and measures law, but that the governor was much interested in the subject and desired to secure a constructive outline for legislation to be introduced at the next session. He expressed the conviction that a general State law would be adopted.

LOUISIANA.

By J. N. SIREN, *Inspector of Weights and Measures of New Orleans.*

Mr. Siren reported briefly the system of weights and measures inspection in use in the city of New Orleans, with special attention to the methods employed in the case of liquid-measuring devices. It appears that there is an excellent opportunity of securing constructive legislation at the coming session of the legislature.

MASSACHUSETTS.

By JOHN J. CUMMINGS, *Acting Chief State Inspector, Division of Standards.*

Mr. Cummings reported the activities of the department especially in relation to the action taken upon weighing and measuring apparatus of different types, and gave a résumé of 10 acts and a resolve affecting the department which were passed during the past year.

MICHIGAN.

By A. A. GREER, *Chief, State Weights and Measures Division.*

Mr. Greer reported that the progress made in the regulation of weights and measures in his State had been especially marked during the past year, more having been accomplished than in any previous year. He referred to the success attending the last State convention of weights and measures officials.

MINNESOTA.

By R. F. BARRON, *Commissioner of Weights and Measures.*

Mr. Barron reported several important change of personnel in the State department. The improvement of the condition of the apparatus in the State was briefly detailed, and the prosecution and conviction of 86 offenders against the laws was noted.

NEBRASKA.

By LEO STUHR, *State Secretary of Agriculture.*

Mr. Stuhr reported the entire revision of the weights and measures law, which now provides, among other things, that dry commodities shall be sold by weight or count or in containers. A law requiring that bread be sold only in standard-weight loaves of 8 ounces, 1 pound, 1½ pounds, or multiples of a pound, was also enacted.

ANNOUNCEMENTS AND APPOINTMENT OF COMMITTEES.[2]

The CHAIRMAN. Gentlemen, I will announce the entertainment committee as Mr. McGrady, of Pennsylvania; Mr. Steinel, of Milwaukee; and Mr. Smith, of the Bureau of Standards.

We have ascertained that it will be convenient for a small committee to meet Mr. Fischer. I will therefore appoint Mr. Holwell, Mr. Schwartz, Mr. Cluett, and Mr. Moynihan to serve on that committee.

The next item on the program is the exhibit, and since the exhibit is over in the same building where we will have luncheon, we will not meet here until 2.45, giving you a chance to visit the exhibit while you are over there.

(Thereupon, at 12.35 o'clock p. m., the conference took a recess until 2.45 o'clock p. m.)

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[2] For appointment of other committees see p. 23.

SECOND SESSION (AFTERNOON OF MONDAY, MAY 23, 1921).

The conference reassembled at 2.45 o'clock p. m., Dr. S. W. Stratton, chairman, presiding.

ABSTRACTS OF REPORTS OF STATE DELEGATES—Continued.

NEW HAMPSHIRE.

By H. A. Webster, *State Commissioner of Weights and Measures.*

Mr. Webster reported the progress made by the department in the State, giving particular attention to the cooperation of the State department with local sealers, a campaign of education conducted, the continued successful operation of the wood law, and the inspection of track scales in conjunction with the National Bureau of Standards track-scale testing equipment.

NEW JERSEY.

By Frank Wanser, *State Superintendent of Weights and Measures.*

Mr. Wanser reported in some detail the work of the department during the year and commented on the successful functioning of the weights and measures association of the State. The weights and measures laws were amended in several essential respects and a public weighmaster bill was enacted, but a standard-weight bread bill was unsuccessful.

NEW YORK.

By W. T. White, *Director, State Bureau of Weights and Measures.*

Mr. White reported the work of the department during the year and paid a special tribute to the harmony prevailing between the State bureau and the local officials. A number of special surveys were conducted throughout the State with very beneficial results, and a résumé of several investigations was given and the results obtained described.

OHIO.

By John M. Mote, *Assistant Chief State Inspector of Weights and Measures.*

Mr. Mote reported the passage by the last legislature of a standard-weight bread law and told of the marked improvement in conditions resulting from the enforcement of the standard container act passed two years ago. He also described the Ohio weights and measures organization and outlined the work accomplished during the past year.

PENNSYLVANIA.

By WILLIAM B. MCGRADY, *Chief, State Bureau of Standards.*

Mr. McGrady reported the passage by the last legislature of five acts affecting the work of the State bureau and discussed in detail the circumstances leading to the passage of the act giving the State bureau authority to pass upon types of weighing and measuring instruments. He also mentioned the large number of coal scales tested in Pennsylvania.

RHODE ISLAND.

By WILIAM F. GOODWIN, *State Sealer of Weights, Measures, and Balances.*

Mr. Goodwin reported an increased appropriation granted to the department by the last legislature which would make it possible to greatly expand the weights and measures work in Rhode Island. He said that, in general, conditions in the State were satisfactory.

SOUTH DAKOTA.

By GUY G. FRARY, *State Superintendent of Weights and Measures.*

Mr. Frary reported that the department had been greatly hampered in the past by lack of sufficient funds, but the last legislature had granted an increased appropriation, which would place the work upon a more satisfactory basis. He also told of the enactment of a standard-weight bread law.

TENNESSEE.

By D. J. FRAZIER, *State Superintendent of Weights and Measures.*

Mr. Frazier reported the recent enactment of a law prohibiting the sale of dry food commodities except by weight. He also gave a comprehensive outline of the various weights and measures laws of the State, and expressed the opinion that Tennessee was making excellent progress along these lines.

VERMONT.

By H. N. DAVIS, *Deputy State Commissioner of Weights and Measures.*

Mr. Davis reported especial activity along the lines of supervisory work, particularly in checking the weights of butter packed in the creameries and the weights of coal and ice deliveries. He stated that nearly all commodities in Vermont are now bought and sold on the basis of weight, and that, with the exception of fruits, dry measures have been eliminated.

WEST VIRGINIA.

By G. B. STEWART, *State Inspeetor of Weights and Measures.*

Mr. Stewart reported that every effort was being made to secure the enactment of progressive statutes in West Virginia and outlined the department's legislative program. He mentioned in this connection bills relating to standard packages, clinical thermometers, standard-weight loaves of bread, ice, and scales for coal.

EDUCATION OF PUBLIC TO APPRECIATION OF NECESSITY FOR ACCURACY.

By W. T. WHITE, *Director, Bureau of Weights and Measures, State of New York.*

Mr. President and delegates, the subject assigned to me is broad enough to permit of a long talk. However, I have no intention of inflicting upon you gentlemen here a lengthy address, but will endeavor to be as brief as possible.

Education means progress. Progress usually results in attainment. To my mind, we all have an object to attain, and that is accuracy whenever and wherever weights and measures are concerned. In order to reach the goal of accuracy, we must first inform the citizens of this country of the importance of many of the phases of weights and measures work. I have no intention of criticising our educational institutions. However, I sincerely believe that this subject is passed over very hastily in such institutions, and to my mind this results in careless and slack methods being employed in business institutions.

Another reason or need for educational weights and measures propaganda—and especially is it true in the State of New York—is the great percentage of foreign born and people who are speaking foreign languages. Commissioner Howell, of New York City, to my mind, is confronted with this problem more forcibly than any other weights and measures official in the country, and the work that Commissioner Howell has done along lines of educating foreign-speaking people in the city of New York has produced some very beneficial results.

At the present time I have under consideration what I call a "Weights and measures primer." This little booklet will be compiled in such a way that it will be interesting and understandable to a child possessing three years of public-school training. We have found that many of the families in our foreign colonies depend to a certain extent upon their children to do the purchasing. Furthermore, these children act as educators in these families; and we hope that the distribution of this primer, which we have arranged for through the educational department, will have this result: That these children will take these primers home with them and impart what simple weights and measures information they contain to their parents. Then, there is another object in this primer, and that is to impress upon the minds of our youngsters, who are to be our future citizens, the importance of accuracy in weight and measure matters.

I have here [indicating] a little booklet which we prepared in our bureau, which was gotten out last year, and we call it "Through the door of thrift." This booklet is gotten out in popular form. We found that the cut-and-dried and technical phraseology and language would not be read by the housewife or, in fact, by others. Those of you who can see it will note that the front page of this booklet is made to represent an ordinary paneled door. On the first big panel it says, "Make your dollar deliver 100 cents through the door of thrift by the way of accurate weights and measures."

I will outline briefly the contents of this booklet. On the first page we note what the functions of the bureau of weights and measures are. On the next page, in cross-section style, we state at the top,

"What the weights and measures bureau helps you to get." Below that you will note a cross section where it says, "You save by thrift." There are such legends as "The weights and measures bureau helps you to get your honest weight or measure in all purchases." On the next page we have a legend, "What the weights and measures bureau wants you to do." Here we have a number of little hints which will help the housewife and other purchasers. The rest of the booklet is composed of several little items, among which are a number which are put under the head of "How to save." The next heading is, "Remember." Under "Remember," for instance, we state, "Remember that the bureau of weights and measures is for the public and there are no charges for its services," and "Remember that this bureau was created for the enforcement of a square deal, but not to adjust differences caused by spite." Another heading we have is, "See that you are not defrauded by inaccurate linear measures." Then we go on to relate what you are likely to encounter in the form of a faulty linear measure. On the next page, "Don't buy when faulty liquid capacity measures, such as the following, are used." In connection with the description of several different faulty liquid measures we show pictures of three different types of faulty measures. On the next page we state, "These dry capacity measures will cheat you." There we describe some faulty dry measures, showing the pictures of cut-down, false-bottom measures. On the next two pages are pictured some fraudulent scales. Then the book has weights and measures tables and useful information for the housewife.

The value of weights and measures exhibits, I think, is appreciated by all weights and measures officials, and in New York State we do as much of this kind of work as our funds will permit. I have found that it affords an excellent opportunity for distributing such weights and measures literature as I have here and any other that we may have for distribution. Another thing that appears to me as being a very good practice is for a weights and measures official to give weights and measures talks whenever and wherever the opportunity is afforded. It is particularly desirable that a weights and measures official should talk about his work before business associations, classes in economics, mothers' clubs, and other similar gatherings. It is not necessary that a man should be an orator in order to talk at these gatherings. In fact, I believe, and I have found it to be so in practice, that people are more interested in hearing about some of the official's experiences in regard to his work. If a man is inclined to soar away on oratorical flights, I think that the purpose of his talk is killed at that point.

Newspaper publicity is desirable—you might say necessary—but it must be "good stuff," as a newspaper man calls it. It must be authentic, and it must be straight from the shoulder. Otherwise it is taken for the product of an overworked publicity agent.

When I was a sealer and carrying an inspector's kit I realized the need for some kind of educational news for the sealers themselves. Therefore, one of the first tasks that I set about when I became the head of the State bureau was to start what we call our monthly "Sealers' news letter." This humble little publication is gotten out with the aid of a very competent stenographer and a willing mimeograph operator. The sealers themselves contribute most of the articles for this little paper, and each month it is prepared and sent to

each of the sealers. In this way the sealers in the different cities and counties are kept informed as to particular activities of other city or county sealers.

I do not claim that my system of educating the public, if you please, is the best, but I do claim that the weights and measures official who is not doing some kind of work along this line is not fulfilling all the obligations of his office.

I thank you.

DISCUSSION OF ABOVE PAPER.

The CHAIRMAN. It might be a good plan for each man to have a small lantern, such as can now be purchased at a cost of from $25 to $50. The bureau has a number of interesting pictures, and I think we could supply each sealer with a few slides that you would like to show in connection with the history of weights and measures.

APPOINTMENT OF COMMITTEES.[3]

The CHAIRMAN. I desire at this time to announce the appointment of several committees. On the committee on the weight standardization of bread, to fill the vacancy caused by the resignation of Mr. Neale, we have appointed Mr. W. T. White, of New York. Mr. Schwartz is now the chairman of this committee. The committee on publicity is Mr. Greer, of Michigan; Mr. Roberts, of the District of Columbia; and Mr. Payne, of Monroe County, N. Y. The committee on nominations is Mr. Cluett, of Chicago; Mr. Schwartz, of New Jersey; Mr. Mote, of Ohio; Mr. Davis, of Vermont; and Mr. Rinn, of Allentown, Pa. The committee on resolutions is Mr. Frary, of South Dakota; Mr. Webster, of New Hampshire; Mr. Cummings, of Massachusetts; Mr. Stuhr, of Nebraska; and Mr. Holwell, of New York.

REPORTS OF OTHER DELEGATES.

Reports were also made to the conference by the following officials: G. F. Seay, deputy inspector of weights and measures, Richmond, Va.; Augustus F. Bove, sealer of weights and measures, Portland, Me.; Joseph J. Holwell, commissioner, mayor's bureau of weights and measures, New York City; Charles A. Schultz, sealer of weights and measures, Dayton, Ohio; H. S. Peabody, inspector of weights and measures, State of New Hampshire; Court Bellis, city and county sealer of weights and measures, Ithaca, N. Y.; Morris Perell, inspector of weights and measures, Stamford, Conn.; Charles J. Quinn, city sealer of weights and measures, Buffalo, N. Y.; Clyde Garrett, city sealer of weights and measures, Chattanooga, Tenn.; Howard R. Estes, city sealer of weights and measures, Flint, Mich.; W. F. Steinel, city sealer of weights and measures, Milwaukee, Wis.; W. H. Barr, deputy county sealer of weights and measures, Lisbon, Ohio; D. C. Hill, inspector of weights and measures, Dallas, Tex.

At this point a motion to adjourn was made and seconded, and the motion was agreed to.

(Thereupon, at 4.30 o'clock p. m., the conference adjourned to meet at 10 o'clock a. m., Tuesday, May 24, 1921.)

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[3] For appointment of other committees see p. 18.

THIRD SESSION (MORNING OF TUESDAY, MAY 24, 1921).

The conference reassembled at 10.15 o'clock a. m. at the Bureau of Standards, Dr. S. W. Stratton, chairman, presiding.

The CHAIRMAN. The meeting will please come to order. We have before us this morning a very interesting program. There is before us now this question of bread legislation. We have had a special committee considering this, but I did not realize until yesterday to what extent you are all thinking of it. The question came up yesterday as to the relation between the conference and the bakers and as to the attitude of the bakers. The bakers are reasonable men, just as you people are. They are on the producing side, and you represent the consumers. I think that the secret of getting along in all of these things is to get together and base all decisions upon the real merits of the case. If that method is pursued, you can always arrive at conclusions that are fair to both sides. So it is with very great pleasure that I introduce this subject this morning, and I am especially glad to call upon the first speaker, Dr. H. E. Barnard, who is with us to-day, to speak on bread legislation from the baker's standpoint. Dr. Barnard.

BREAD LEGISLATION FROM THE STANDPOINT OF THE BAKER.

By H. E. BARNARD, *Director, American Institute of Baking.*

Dr. Stratton, ladies and gentlemen, and old friends, a year ago I felt it necessary to decline an invitation from your secretary to address your Thirteenth Annual Conference on the subject of "Standard weights for bread." It was of interest, however, to know that the subject was brought before you, and that following the address by Commissioner Neale a committee was appointed to study the matter of standardization and to make a report at the next conference.

During the past few months it has seemed to the baking industry that every State legislature has thought it necessary to regulate the baking industry, and so, in view of the fact that the topic is a live one both to the baker who wishes to comply with the laws and regulations and to commissioners of weights and measures who are interested in adopting some uniform method of handling this important subject, I have this year accepted Mr. Fischer's invitation and have come to Washington to talk to you, not as I once had the pleasure of doing, as an official charged with enforcing weights and measures laws, but as a representative of the baking industry.

Let me assure you that the bakers of the country are heartily in sympathy with any legislation which will benefit the consumer. The baking industry lives because of the good will of the bread eater. Any legislation which will secure better service for the consumer must of necessity benefit the industry, and so I am glad today to tell you what the baker thinks of the subject of standard weights as it applies to the loaf of bread.

I shall frankly say that all bakers do not think alike on this subject. Varying conditions in the several States and in the larger cities have thus far made it impossible for them to get the same viewpoint. They are not agreed that bread should be sold by standard weight. They are all of one opinion, and that is that the consumer should get what he pays for and know what he is getting. That is the reason why you gentlemen are enforcing different types of laws in your several States; that is why the laws of Massachusetts and Texas are different; that is why the New York baker who ships bread across the river finds it necessary to conform to the Federal law governing the interstate shipment of bread and mark the weight of the loaf on the package. But, in addition to this requirement, he must also comply with the law of the State of New York and with the municipal code of the city of New York. His bread must meet the regulation requirements of every city and borough in New York to which he ships. When shipments go across the State lines into Connecticut, New Jersey, or Pennsylvania they must run another gauntlet and meet the critical inspection of you gentlemen who serve those States.

I assure you, gentlemen, that the baker has very real reasons for his interest in the laws which you are enforcing, and it is his desire to work with you in perfecting legislation which will absolutely protect the consumer and, at the same time, be uniform in character, both as to construction and enforcement. I wish it were possible for you to hear the arguments which time and again have been presented by leading bakers against the adoption of standard-weight legislation, and then that you could listen to the arguments of other bakers who have favored such legislation. Out of this conflict of opinion I am sure it would be possible for you to draft regulations which would meet the ends desired by you as officials, by the public, and by the baker. But since this is not possible, I shall, as best I can, marshal the facts before you.

The baking industry believes that if you have the facts and appreciate the desire of the baker to work with you, rather than to oppose you, nothing but good can result. Weights and measures legislation has become necessary in order that fraud and deceit may not be practiced against the public. Such legislation proposes to set up a square deal between the producer and the consumer; it proposes to establish a true measure of bread value; it proposes to make unfair competition impossible.

It is not necessary to discuss with you gentlemen the enforcibility of any statute, for you know what you can do and how successfully you can work. The argument against the standardization of bread weights—that is, against fixing the weight of the loaf at 16 ounces or 24 ounces, 12 hours after leaving the oven—has been ably set up in a recent issue of the Northwestern Miller. I do not think I can present the argument any more clearly than in the words of the editor, who says:

> "Standardization" has become such a potent word in the mouths of those who know little or nothing about what it really means, and the whole system of weights and measures is, very properly, so jealously safeguarded by law, that any proposal to establish standard weights for such an essential commodity as a loaf of bread is bound to have strong support, and the only way to oppose it effectually is to educate public opinion as to what it actually involves.

If the unit price for bread were a large one, like that for a ton of coal or a barrel of flour or a bushel of wheat, there could be no possible objection to the standardization of weights. With a large selling price even the smallest variations in manufacturing, transporting, and selling costs can be accurately reflected in the charge made to the final purchaser. [Remember, this is the argument not of a baker but of a miller.] For example, if cash wheat drops 1 cent, the miller takes approximately 5 cents from the selling price of a barrel of flour, the reduction amounting to about six-tenths of 1 per cent of the total price. In this way the consumer is assured of the full benefit of every decrease, however slight, in the cost of wheat and the expense of flour milling, and, conversely, the producer is protected by his ability to reflect accurately every increase in his expenses in his selling price.

This principle, however, can not possibly be applied to the loaf of bread. With 10 cents as a basic price, a decline corresponding in extent to that just indicated in the case of flour would mean a reduction of six-tenths of a mill in the retail price, a difference which could hardly be expressed even by the use of German pfennigs at the present rate of exchange. As recent experience has shown, the change of a cent, either up or down, in the bread price means a very extensive shift in the baker's costs, and yet a cent is the smallest possible unit by which such changes of price can be measured.

Furthermore, the consumer who buys baker's bread is purchasing quality as well as quantity. He can get a pound of alleged bread which will do him absolutely no good, or he can get exactly the same weight of the most nourishing food in the world. Between these extremes there are innumerable variations of quality for which no system of accurate standards has ever been devised. The proposed Federal definition for bread may, if adopted, serve to rule out the very poorest varieties, but these are negligible under any circumstances, as competition nowhere permits any baker to produce them. The things that determine bread quality are such as to defy any system of standards ever devised, and they are vastly more important than matters of weight.

Standardized weights for bread mean, first, that the baker has no way of passing on to the consumer the immediate benefits of slight reductions in his own expenses, nor has he any protection in case his costs correspondingly advance. Second, they mean that the consumer is assured only regarding the actual weight of the bread he buys, without the slightest guaranty as to the thing which really matters—its quality. If the baker sees his expenses rising without the justification for an increase of a full cent in his selling price, and if he can not reduce the weight of his loaf by so much as the fraction of an ounce, his inevitable temptation is to sacrifice enough in the matter of quality to offset the loss he would otherwise sustain.

The sliding scale of bread weights operates directly and immediately to the advantage of the consumer, because the baker's costs are accurately measured by the selling price and the weight of the loaf taken together. It helps the baker, because bread prices are notoriously hard to change, either up or down. If they are even a fraction of a cent too low, the baker's small margin of profit is wiped out, whereas if they are too high some more reckless or more fortunate competitor promptly steps in and secures the trade on a cut-rate basis.

The only argument in favor of the standard bread-weight system—its alleged protection to the public—collapses, both because it absolutely fails to afford any protection at all in the matter of quality, which is the thing that really counts, and because it defeats its own purpose by denying the consumer's right to the full benefits of lower production costs.

So much for the argument of the Northwestern Miller. May I make a practical application of one of the points, namely, the impossibility of passing on the benefits of decreased production cost to the consumer by quoting an advertisement which recently appeared in the Detroit papers:

Under the old sliding scale of bread weights in force before the war the fluctuations of the wheat market could immediately be reflected in the real price of the loaf by a slight change in weight. Under the sliding scale of bread weights, for example, the undersigned bakers could give the customers of Detroit a 22-ounce loaf for 14 cents. On the basis of a daily distribution of 111,128 loaves for one company and 75,000 for another, the customers of Detroit would have saved $33,534 during the month of January alone.

As large as this sum is, it is by no means the greatest gain to the consumer. Under the arbitrary 24-ounce loaf ordinance the baker has no recourse in case of a sudden increase in the price of wheat flour but to jump the price of bread at least 1 cent per loaf, when the increase in cost may have amounted to but a fraction of a cent per loaf; or, since the public does not like price increases, to keep a general high price level in fear of a sudden rise in the wheat-flour market which may never come; or, and this is very important, to give the consumer lower-grade breal.

The Massachusetts law, which many bakers believe is a model law, embodying as it does sanitary regulations and the provision that bread shall not be sold otherwise than by weight, and then only in units of 16 or 24 ounces, further provides that these unit weights shall not apply to loaves which are plainly labeled with the weight and the name of the manufacturer. In other words, loaves weighing 16 or 24 ounces need not be labeled with the net weight, but if conditions justify the baking of loaves slightly different from the standard loaves it is only required of the baker that such loaves be labeled as to their exact weight. Under this law the public is protected. It knows how many ounces of bread it gets for 8, 9, or 10 cents. It is possible for the housewife to measure quality values with quantity values. The baker who makes a loaf of larger volume, which looks like a pound loaf but weighs less, shows by the label exactly what the loaf does weigh and so provides a measure of value more accurate than that of the eye of the purchaser.

The Massachusetts law does not operate to lower bread quality, and the baker who wishes to make a superior loaf—richer in milk, or sugars, or shortenings at increased cost—can regulate his price accordingly, and that price will be reflected past the grocery store or other distributing agent to the consumer.

These are the arguments advanced by a large number of bakers, perhaps the majority. Another group of bakers, however, take a different stand. During the war the United States Food Administration operated the bakeries of the country. The regulations set up the formulas by which the bakers worked; they determined the size of the loaf and its method of distribution. One of the important regulations provided that all bread should be sold by a fixed standard unit weight. The results of this regulation were set forth in an excellent paper read before the convention of the Southeastern Bakers' Association. May I quote the argument there advanced:

What the bakers had thought impossible before the creation of the Food Administration worked like a charm, and the trade being relieved of the destructive competition in weight and of the necessity of constantly watching the juggling of weights by their competitors could settle down to the more important problem of furnishing the people, even under adverse conditions, with quality bread at a price which, despite the extraordinary and oftentimes exasperating circumstances, made bread still the cheapest and best food on the American table; in fact, the envy of all European countries, where so-called war bread even to-day is remembered with a shudder.

This standard weight insisted upon by the Food Administration is one of the regulations referred to as having been found so advantageous by the majority of the bakers that in a great many cities the rule has been either voluntarily adopted as a sound business practice by the bakers or, at the instance of the trade, has been incorporated in new afterwar bakery laws and regulations.

Now, if a standard weight for bread was good for trade during the war, when it helped the baker to assure for himself a standing with the public, when the people with every justification took the greatest pride in the achievements of the American baker, and when confidence in the commercial baker correspondingly increased by reason of his accomplishments in the face of discouraging condi-

tions, what possible argument can be advanced that the selling of bread by weight is not good for the baker in times of peace? * * *

The excuse in most cases is—and in my belief it is a very poor one at that—that we have no coin small enough to justly reflect the necessary changes in the price of bread as produced by the fluctuations in price of all the materials that go into it. It is very honorable of these gentlemen to want to be so just to the consuming public, but I do not believe that their excuse will stand the test. As the commissioner of foods and markets of the State of New York only recently told a delegation of bakers, in the speaker's hearing, this absence of small coins from our currency would not affect the ethical and economical advantages of standard weight for bread. The official pointed out that this apparent disadvantage would work out to the satisfaction of all, and that he, speaking for the public, was quite prepared to take the lean with the fat. In other words, if the baker was forced, by reason of an absence of smaller denomination coin, to charge a fraction of a cent more for his bread than under the market changes he was really entitled to, the possibilities are that the next month the rule would work the other way, and the public would be the gainer of a like amount by reason of the same. * * *

The establishment of a standard weight would greatly facilitate the handling of the pans in the average bakeshop and would eliminate the purchase of extra pans from time to time, which of necessity must be done as the baker sees fit to decrease or increase the weight of his loaf. This is an advantage of standardization, and in every sphere of commercial activity where packages or containers are being used the number of these has been cut down as a matter of reconstruction expediency and economy.

I shall not quote further from this clear-cut presentation of the arguments in favor of standard-weight bread, but I do want to call attention to one paragraph of the address which should gladden the heart of every weights and measures official, and that is as follows:

While I am heart and soul, of course, in favor of the introduction of standard weight for bread, I am not blind to the fact that all laws and regulations pertaining to such a step will be of benefit to the industry only if these laws and regulations are strictly and honestly enforced. In States where standard-weight laws have been put on the statute books the one great mistake has been that no appropriations sufficiently large have been made for the enforcement of them, and that the inspectors and other officials having the carrying out of the law in charge are far too few to make it effective. A standard-weight law without due enforcement would be as bad as no law at all. But we have ample proof that the bakers themselves are able and willing to assist the Government officials in the carrying out of the law—referring now to the advisory boards of bakers who worked in most of the States with the officials during the reign of the Food Administration. If standard weight should be adopted all over the country, the reestablishment of advisory boards would be in order, and the bakers themselves should police the trade and see to it that fair play was accorded to all, and that the law was being carried out by every member of the trade.

This closes the argument. Men better posted in the intricacies of the baking industry than I are here ready to tell you just how bread legislation affects the baker, his bread, and his customers. It is your business to balance all the facts I have given you and all those that may be brought to your attention and to draft uniform legislation which will benefit consumers and the baking industry in States and cities alike. But may I urge as strongly as I can that your committee on legislation work slowly and carefully?

Out of the crop of ill-conceived and crudely-drafted bills which have been before our legislatures during the past few months and which, I am glad to say, for the most part, did not originate in the offices of the commissioners of weights and measures, several measures have become laws. At the present time a number of States require bread to be sold by standard weight. Bakers working under

these laws can not change the size of the loaves, no matter what conditions at the bakery may demand. It may be that these laws will operate successfully both for the baker and the consumer. On the other hand, as you gentlemen enforce them you may find that they are impractical, that they are not helping the consumer, and that they are detrimental to the baker. May I urge you, therefore, to delay drafting any standard bill until by the operation of these laws it may be determined by actual experience just how helpful they are?

We have here an opportunity, and now I speak as one who has had much experience in drafting and enforcing weights and measures legislation and as the director of the American Institute of Baking, to formulate a real bread law—a law which will furnish complete protection to the consumer against the vicious baker who would cheat his customers, a law which will regulate competition, a law which will place the products of the baking industry on a par with other food commodities which are sold in package form.

We believe in labeling bread with the weight of the loaf and would insist that the label must tell the truth. We want the weights and measures officials, no matter where they are working—in the cities, the country, or in the States—to enforce the law to the very letter, but we do not want legislation passed which will made it impossible for the baker to fit his business to the fluctuating markets and to regulate the size of his loaf accordingly.

The baking industry comes to you for assistance and advice. It wants your cooperation in the suppression of every fraudulent practice. It looks to you to protect the industry whenever it is unfairly attacked. And, I think, right there, gentlemen, I must pause to emphasize that point. I believe that industries of this country have certain rights which they have not in the past exercised as they should. I believe it is the duty of a man who is engaged in producing and distributing food to tie up with his commissioner of foods in his State. I believe it is the duty of a man who uses the scale in his business to make closer contact than he has with the weights and measures officials. There has been too much misunderstanding between the official and the man who is under inspection, simply because the men have not got together. We are here to-day, I believe, for the purpose of getting together.

So the baker looks to you to protect the industry whenever it is unfairly attacked. It will go to you whenever the subject of honest weights and measures arises. I can also assure you that while he is very seriously opposed to the drafting of any legislation which will operate to the disadvantage of the consumer or against the development of better practices in the industry, no baker, who has the right to be called a baker, will willingly or willfully violate any law or regulation which you gentlemen are sworn to enforce.

This is the first opportunity I have had to speak to you for several years. It has been a pleasure to meet you again, and I hope that out of this and similar conferences may grow a strong feeling of partnership in the important business of placing our industries on a stable basis. May I ask you when you go back to your offices not to forget that the American Institute of Baking wants an opportunity to work with you? It speaks for the baker and his vitally important industry, but it knows that the baker's success will be commensurate with the

service he renders. Let us all work together, that that service may be of utmost good to the consumer.

(At this point H. A. Webster, of New Hampshire, assumed the chair.)

PROPOSED BREAD WEIGHT LEGISLATION IN ILLINOIS.

By William F. Cluett, *Chief Deputy Inspector of Weights and Measures, Chicago, Ill.*

Mr. Chairman, gentlemen, delegates, and guests, should loaves of bread be sold by certain prescribed weights only or should the baker be allowed to sell any weight he desires, providing it is labeled with the weight and name of the manufacturer?

The bakers of this country are apparently well organized and are endeavoring to have laws passed in the different States that will permit them to sell loaves of bread of any weight they see fit to bake, with the simple concession to the rights of the purchaser of marking the loaves with their weight and the name of the manufacturer. As there is no law in this country to set the price at which a commodity or article shall be sold, this simply means that the purchaser is at the mercy of the baker as to how much the loaf shall weigh and how much he will have to pay for it.

One of these bills was introduced in the Illinois Legislature last month, and I fancy it is along lines that they desire to have passed in other States. This bill is particularly obnoxious to us for various reasons, which I will point out and which, I think, will be of interest to other sealers who may have similar bills introduced in their jurisdictions.

I wish to explain, first, that the State of Illinois has no active State weights and measures department, and that the local sealers are all appointed and their salaries paid by the city or town in which they are located; that the laws or ordinances they work under are promulgated by their city councils under police powers conferred upon the councils by the State. The Illinois bill reads:

A BILL For an Act regulating the sale of bread.

Be it enacted by the people of the State of Illinois, represented in the General Assembly, Except as hereinafter otherwise provided, bread shall not be sold or offered or exposed for sale otherwise than by weight and shall be manufactured for sale and sold only in units of sixteen or twenty-four ounces or multiples of one pound. When multiple loaves are baked, each unit of the loaf shall conform to the weight required by this section. The weights herein specified shall be construed to mean the net weights twelve hours after baking to be determined by the average weight of at least twelve loaves: *Provided, however,* Such unit weights shall not apply to rolls or fancy bread weighing less than four ounces nor to loaves bearing a plain statement in intelligible English words and figures of the weight of the loaf and the name of the manufacturer thereof. In case of wrapped bread, such information shall be stated upon the wrapper of each loaf; and in the case of unwrapped bread, it shall be stated by means of a pan impression or other mechanical means, or shall be stated upon a label not larger than one by one and three-quarters inches and not smaller than one by one and one-half inches. Such label affixed to an unwrapped loaf shall not be affixed in any manner or by use of any gums or pastes which are unsanitary and unwholesome, and there shall not be more than one label on a loaf or unit. The Department of Agriculture shall prescribe such rules and regulations as may be necessary to enforce this section, including reasonable tolerances or variations within which all weights shall be kept: *Provided, however,* That such tolerances or variations shall not exceed one ounce per pound under the standard

unit or marked weight. The Department of Agriculture and, under its orders, the local sealers of weights and measures, shall cause the provisions of this section to be enforced.

SEC. 2. Before any prosecution is begun under this act the parties concerned shall be notified by written notice and be given an opportunity to be heard before the said department.

SEC. 3. Any person convicted of violating section 1 of this act shall, for the first offense, be punished by a fine in a sum of not less than fifteen dollars ($15) and not more than one hundred dollars ($100), or by imprisonment in the county jail not exceeding thirty days, or by both such fine and imprisonment, in the discretion of the court, and for the second and each subsequent offense by a fine of not less than twenty-five dollars ($25) or more than two hundred dollars ($200), or by imprisonment in the county jail not exceeding one year, or by both such fine and imprisonment, in the discretion of the court.

I will first point out our objections to the bill as drawn and then give our answers to the arguments and reasons advanced by the bakers as to why they desire a law of this kind enacted. The bill in the first eight lines provides that bread shall be sold by weight and made into loaves or units of 16 ounces, 24 ounces, or multiples of 1 pound, the weights herein specified to be construed as net weights 12 hours after baking and to be determined by the average weight of at least 12 loaves. Now, that reads perfectly fair and reasonable, and had they added "of any one unit," we would have agreed that thus far it was fair and aboveboard; but in the next four lines it turns around and undoes the good that was contained in the first eight lines by reading—

Provided, however, Such unit weights shall not apply to rolls or fancy bread weighing less than four ounces nor to any loaf bearing a plain statement in intelligible English words and figures of the weight of the loaf and the name of the manufacturer thereof.

That is surely blowing hot and cold in the same breath. First, it provides for certain standard weight loaves, and then turns around and, in effect, says to the baker, "If you do not care to bake the weight loaves specified, bake any weight you like as long as you label them with their weight and the name of the manufacturer."

Except for the purpose of kidding or bamboozling the public it should read, "All bread shall be sold by weight and made into loaves or units of any weight desired by the baker and shall be labeled with its weight and the name of the manufacturer."

The bill then continues and provides for methods of marking the weight to be either upon a printed label, by pan impression or other mechanical means for unwrapped bread, or upon the wrapper for wrapped loaves. The size of the label is provided for, but nothing is said about the size of the letters or figures showing the weight except that they shall be "intelligible English words and figures." This is rather vague. What terms shall be used to give the information pound, pound and a half, or multiples of a pound or ounces? In Chicago there are many people who do not know how many ounces constitute a pound. Therefore, the number of ounces would not mean very much. A loaf of bread to many means 1 pound of bread. That seems to have been the weight since time immemorial for a loaf of bread, so if the loaf is labeled 1 pound or 1½ pounds, or 1 pound multiples it fixes some sort of a standard for them; but with no size specified for the letters or figures on the label they could be so small as to be almost unreadable.

This, however, is really a small matter in comparison with what follows. Starting at line 20, the bill again takes up the bakers' cause. It reads:

The Department of Agriculture shall prescribe such rules and regulations as may be necessary to enforce this section, including tolerances or variations within which all weights shall be kept.

That sounds fair enough; but here, again, follows a proviso—

Provided, however, That such tolerance or variation shall not exceed one ounce per pound under the standard unit or marked weight.

Lines 7 and 8 read that—

The weights herein specified shall be construed to mean the net weights twelve hours after baking, to be determined by the average weight of at least twelve loaves.

The weights therein specified are 16 or 24 ounces or multiples of 1 pound. Consequently, these are the only weight loaves that must average the correct net weight in any certain number of loaves, and there is no necessity for baking these weight loaves, because the first proviso in the bill says so. Therefore, for all other weight loaves the baker is to be allowed a tolerance of not exceeding 1 ounce per pound under the standard unit or marked weight.

Any reasonable person, even a baker, should agree that so far the baker has been pretty well looked out for, but the first section ends up with these words:

The Department of Agriculture and, under its orders, the local sealers of weights and measures shall cause the provisions of this section to be enforced.

This takes away all independence of action from the local sealer in the regulation of the sale of bread and would cause the repeal of all local ordinances passed by the city council in conflict with the provisions of this bill and make the local sealer subservient to the State Department of Agriculture. At the present time there is nothing said in this act about the quality of the bread in the loaf, and for that reason we can see no reason why the Department of Agriculture should have the enforcing of a straight weights and measures provision. Weights and measures regulations in Illinois come under the Department of Trade and Commerce, and it is only reasonable and logical that if the proposed law were put under any State department it should be the trade and commerce department.

Section 2 of this act we consider to be a most unreasonable provision. It would not only assist the baker to delay, but to escape prosecution, and, in addition, we consider it to be an insult to the intelligence, honesty, and capability of the local sealer. It reads as follows:

SEC. 2. Before any prosecution is begun under this act the parties concerned shall be notified by written notice and be given an opportunity to be heard before the said department.

The local sealer in order to justify his acceptance of the salary paid him by his city or town is to be allowed to go out and weigh up and investigate the weights and markings of the loaves of bread sold in his jurisdiction. Then, if he finds violations, no matter how glaring or flagrant, can he prosecute? Oh, no; he must first notify the parties concerned by written notice and the Department of Agriculture by written notice, and after they have received their written

notice the local sealer must wait until he receives notice that the Department of Agriculture will give him a hearing on the matter on a certain day, and he can then spend some more of his city's or town's money to go to Springfield for a hearing as to whether or not the Department of Agriculture thinks the baker should be prosecuted. If they do, he may start the prosecution, and if they do not, he can go home and do some more investigating.

We believe that it is perfectly right and proper for a State department to prescribe rules and regulations and reasonable tolerances and variations in the interest of uniformity and for the guidance of the local sealers, and that it should have the right to enforce the provisions of the act in those places in the State where no local sealer is appointed; but to not only give the right to the local sealer but make it his duty to make all investigations and to collect all necessary evidence and then wind up by saying that before any prosecutions shall be started under this act the parties concerned shall be notified by written notice and given an opportunity to be heard before the Department of Agriculture is impugning the intelligence, honesty, and capability of the local sealer. He is presumed to be honest, intelligent, and capable enough to perform all other duties under this act except where he finds violations, and there his honesty, intelligence, and capability end.

We believe that a bill of this kind should not be enacted into law, because it is unfair, unreasonable, and vague in meaning in spots and entirely too broad in other places.

We will now take up and answer the arguments advanced in favor of the passage of this bill. The bakers who are advocating the passage of this bill say that they are doing so in the interest of the housewife; that they want to be allowed to bake loaves of bread in any desired weight, providing they label it with the weight and name of the manufacturer, in order that the housewife may at all times receive as large a loaf of bread as she is entitled to, which is impossible to do under the present system of requiring certain specified standard weight loaves. Now, that is a very laudable and praiseworthy reason.

They say that, owing to the frequent slight changes in the cost of flour and to the fact that 1 cent is the smallest denomination in our currency, it is impossible at all times to give the housewife a square deal by increasing the price of the loaf a full cent when the increase in the cost of flour only amounts to a fraction of 1 cent per loaf, but if allowed to change the weight they could at all times give the housewife and baker a square deal.

This same argument was used years ago when they were opposing the passage of the Chicago bread ordinance, but at that time they used the additional argument that they were compelled by custom to always sell a loaf of bread for 5 cents, as the public considered that the standard price and they would not pay 6 or 7 cents, so for these reasons they should be allowed a sliding weight or tolerance.

The war has proved they were mistaken in this idea, as witnessed by the increase in street-car fares and loaves of bread and other articles that formerly sold at 5 cents and have since been increased in price. They say that bread should not be singled out and only certain prescribed weights allowed to be sold; that it is permissible

to mark the weights on hams and sides of bacon and sell them by marked weight, and in their opinion it is only fair to allow loaves of bread to be sold in the same manner. They neglect saying that the size and weight of a ham or side of bacon are controlled by nature, and that they are not sold at so much per ham or side of bacon but at so much per pound.

Butter, if made up into prints or bricks, is required to be made up into certain prescribed weight bricks or prints. Berries, if sold in boxes or baskets, are required to be sold only in certain prescribed sizes.

If bread were made up of various different size and weight pieces and then wrapped or put into package form, we would agree that marking the weight on the wrapper or package would be a reasonable regulation; but when we consider that bread is made in a batch of dough and baked into a loaf the size and weight of which is controlled by the baker, and that it is sold by the loaf at a price controlled by the baker, then we submit that the weight of the loaf should be prescribed by law in order that the purchaser may be protected.

We believe that the answer to the baker's argument that he should be allowed to change the weight of the loaf when there is only a slight fluctuation in the price of flour is that when the increase amounts to less than one-half of 1 cent per loaf no change should be made in the selling price of the loaf, but when it amounts to one-half cent or more, then the selling price of the loaf should be increased a full cent. This would equalize the changes in the cost of production and marketing and would leave a standard weight that could be checked against at all times.

Would the bakers consider it right for the millers to change the weight of the barrel of flour or the weight of a 100-pound sack of flour to something less than 196 pounds for the barrel and 100 pounds net for the sack because the price of wheat and other costs rise and fall? Would they not insist that the change be made in the price only, in order that they would have a fixed, unchangeable weight standard that they could check up their business on?

We should remember that, while the bakers advance very laudable and praiseworthy reasons for wishing to be allowed to bake their loaves of any desired weight, they are not in business for philanthropic or sentimental reasons or because they have the welfare of the bread-eating public so much at heart. They are in business for the very same reasons that people are engaged in other lines of business—to make money.

And there is another but more selfish reason for desiring a law of this kind that they have not placed so much stress on. That one is competition. There are at the present time certain other bakers who are putting out standard-weight loaves of bread that are selling for a lower price than these bakers can afford to sell their loaves of a similar weight for. The consequence is that these other bakers are cutting into their trade. The bakers say that these other loaves are made up of cheaper materials than they use and that is the reason they can be sold cheaper.

The answer to this argument is that if these loaves are wholesome and contain no deleterious substance there is nothing in the law to prevent them from using similar materials and competing with

these other bakers at their own standards, and they can still make their regular loaves and get the trade of the more discerning public who prefer quality to quantity or price. If the materials used are unwholesome and contain deleterious substances, then they can get the health department after them and prohibit their sale.

These bakers say that their bread is mixed with milk and contains only the best of ingredients, and that a certain professor has pointed out that this is the healthiest form of food for children, and so forth, and they would like to have a quality provision inserted in the bread law providing that only bread of this quality shall be sold.

We believe that a quality provision would be perfectly proper, but that it should be broad, providing that no bread should be allowed to be sold that was unwholesome or that contained any deleterious substance or material, and that it should be made in a clean and sanitary place; but we can see no reason why this provision should require that no bread should be allowed to be sold unless mixed with milk and other certain prescribed materials if bread mixed with water and compound or vegetable oils is wholesome and can be sold for a cheaper price.

If the baker is to be allowed to tell us the exact quality of the bread and the weight and price of the loaf that we may buy, it will be only a short step for other dealers to regulate what we shall eat, wear, and use, the quality, the price, and the amount we shall receive.

The bakers lay great stress upon the honesty of their intentions, because they agree to label the loaf with the weight and the name of the manufacturer. Where is the competition in the sale of bread where there is no required similarity as to weight, price, or quality? How is the housewife protected? She can not ask the price per pound and then order a definite quantity or so many cents' worth at the price per pound asked, which will be weighed out to her like other commodities and which can be reweighed in order to see whether or not she has received the weight she was entitled to receive. No, indeed. It is sold by the loaf, of the weight, quality, and price decided on by the baker.

How can the sealer enforce the weight provisions? Suppose a baker puts out a 15-ounce loaf one day and a 13-ounce loaf the next, and the sealer finds 13-ounce loaves with 15-ounce labels? You say this is purely a short-weight case and the penalty section covers it. What is the baker's alibi? A mistake. His workman got the labels mixed; he has no intention of putting out short-weight loaves, and the workman would be just as liable to put a 13-ounce label on a 15-ounce loaf. The weight printed on the label really does not signify much, because the public is always given as large a loaf as he can afford, considering the quality of the loaf and the cost of production.

Do you think the sealer would get very far with a prosecution of this kind? I do not. He would be accused of persecution and interfering with this baker's business.

The Illinois Legislature in passing the Cities and Villages Act, which is the charter under which the cities and villages of the State function, deemed the regulation of the sale of bread of sufficient importance to devote an entire section to the matter. Section 52 reads that the city council shall have the power to pass ordinances

"regulating the sale of bread and to prescribe the weight and quality of bread in the loaf."

The city of Chicago availed itself of this power and passed ordinances requiring that all bread shall be sold by weight and made into loaves or units of certain prescribed weights, each loaf or unit to be labeled showing the weight of the loaf and the name of the manufacturer. The bakers fought the provisions of this ordinance bitterly, claiming the ordinance to be unconstitutional, unreasonable, in restraint of trade, class legislation, and in violation of the freedom of contract.

The Illinois Supreme Court in a lengthy opinion held that the legislature had the power to authorize cities and villages of the State to legislate upon the subject of the sale of bread in the loaf offered for sale or sold in such municipalities, and said that—

> The power to regulate the sale and determine the weight of bread in the loaf when offered for sale as a legitimate exercise of the police power by such municipalities, as the plaintiff, has uniformly been recognized by the courts and the exercise of such power is now too firmly established to be challenged.

Upon appeal to the United States Supreme Court this decision was upheld (Matthias Schmidinger *v.* the City of Chicago, 226 U. S. 578).

In the case of the City of Chicago *v.* The Bowman Dairy Co. (234 Ill.), which was a case brought by the city of Chicago for a violation of an ordinance requiring that only certain prescribed sizes of bottles should be used in the sale of milk and cream and providing for the marking of the capacities on said bottles—a case that is particularly applicable to the sale of bread in the loaf—the court held that—

> Milk and cream are articles of general consumption. They are usually sold by the pint or quart, and while each transaction involves but a few cents the number of such transactions in a large city like Chicago daily reaches a large sum. The opportunities for fraud in their sale are great, and the ordinary legal remedy afforded the individual consumer to protect himself against deceit and fraud is wholly inadequate. Clearly, therefore, an ordinance like the one under consideration is valid and is not obnoxious to any provisions of the State or National Constitution.

In the case of the People *v.* Wagner (86 Mich.) the court holds that—

> The police power of a State is not confined to regulations looking to the preservation of life, health, good order, and decency; laws providing for the detection and prevention of imposition and fraud, as a general proposition, are free from constitutional objection.

The regulation of the weight of bread in the loaf has been recognized by all courts as a legitimate exercise of the police power of the State. Not everyone eats pork or mutton or onions or olives, but nearly everyone eats bread. Bread is the staff of life and is the most universally used article of food we have. A necessity of this kind should not have a changeable standard of both weight and price. The weight standard should be a fixed, unchangeable standard, the price alone fluctuating with the rise and fall of the cost of production and marketing. The prescribed standard weight for loaves of bread is a matter in which the public needs protection, because it can not protect itself.

ENFORCEMENT OF BREAD LEGISLATION, INCLUDING PROPER TOLERANCES.

By CHARLES M. FULLER, *Sealer of Weights and Measures, Los Angeles County, Calif.*[4]

Gentlemen of the Fourteenth Annual Conference, the following suggestions in regard to the enforcement of bread legislation, including tolerances, are offered as the result of five years' successful enforcement of a standard-weight bread law.

The law itself provides that the standard weight of all loaves of bread within 12 hours after baking shall be 16 ounces, 24 ounces, or multiples of the 16-ounce size. A tolerance of 1 ounce above the standard weight is allowed for each 16-ounce unit. No stated tolerance below the standard weight is allowed, for the reason that were there such a tolerance certain unscrupulous bakers would not hesitate to scale their bread that amount short. At least 25 loaves are weighed and the average taken in determining the standard weight. If there is any doubt about the average weight, several hundred loaves are often scaled.

When the bread is found short and the baker has had a previous good record, all bread as much as an ounce underweight is seized for distribution to charitable institutions and the baker given a warning. If the offense is repeated, the bread is confiscated and the baker is prosecuted as well. All weighings are entered on cards printed for that purpose, and these are filed under the name of the bakery, so that a complete record of every place of business is readily available.

In the enforcement of this act we have convicted 25 bakers, $535 in fines being paid, and several thousand loaves of bread confiscated and turned over to charity. It is interesting to note that the act has worked out so successfully in eliminating the unfair competition of bakers who would cut the price by selling an underweight loaf that even those firms which were first opposed to the idea of a standard-weight bread law are now in favor of it. And I have before me a communication from the secretary of the Southern California Bakers' Association, stating that at a meeting of the Wholesale and Retail Bakers' Association a unanimous resolution was passed indorsing this law.

DISCUSSION OF PRECEDING PAPERS AND OF LEGISLATION RELATING TO THE SALE OF BREAD.

Mr. HOLWELL. Mr. Chairman and gentlemen of the conference, while my friend Cluett was speaking this morning I began to foot up what bread means in America. In New York City we consume daily 3,000,000 pounds of bread, a per capita consumption of half a pound. On this basis, with a population of 110,000,000 in this country, we consume 55,000,000 pounds of bread daily, 20,000,000,000 pounds annually, and since over 50 per cent of our population is in cities it means that 10,000,000,000 pounds of bread are consumed yearly in our cities.

[4] In the absence of Mr. Fuller this paper, prepared by him, was read by F. S. Holbrook.

In New York City we estimate that the 4,000 bakers, both wholesalers and small retail bakeries, manufacture over 90 per cent of our bread. So this means, applying it to the cities of the country, that the bakers bake 9,000,000,000 pounds annually. It means that, if we use the figure of 8 cents for 16 ounces, the manufacturers in the bread industry in America annually receive $720,000,000 for their product. So we are discussing not only the staff of life, but we are discussing a big national industry.

In the State of New York we had a section of the law which read:

Method of sale of certain commodities.—All meats, meat products, and butter shall be sold or offered for sale by weight. All other commodities not in containers shall be sold or offered for sale by standard weight, standard measure, or numerical count, and such weight, measure, or count shall be marked on a label or a tag attached thereto: *Provided, however,* That vegetables may be sold by the head or bunch.

Under the charter of the city of New York the board of aldermen enacted an ordinance regarding bread, reading, in part, as follows:

All bread baked and offered or exposed for sale shall be made of good and wholesome flour or meal and sold by avoirdupois weight. All loaf bread offered for sale not in conformity with the provisions of this article shall be forfeited and may be seized and disposed of for the use of the city.

Mr. Rabenold, representing the bread industry, challenged the legality of the action of the State superintendent of weights and measures, who, cooperating with the officials of the first-class cities, established regulations for the sale of bread. The matter arose in this way: The district attorney of Kings County, my own home county, prosecuted one of the wholesale bakers and succeeded in obtaining a conviction.

Mr. Rabenold carried it to the higher court—I think it was the appellate division—and Judge Thomas wrote the decision in the case, which upheld the contentions of Mr. Rabenold.

The district attorney of Kings County carried the case to the court of appeals, and that court refused to pass upon it. So we in New York State to-day are practically without any regulation for the sale of bread. A bill requiring the sale of bread in standard-weight loaves of 8, 16, and 24 ounces and multiples of 1 pound was introduced in the present legislature, recently adjourned, but it was beaten in committee. The manufacturers opposed the bill, opposed it on various grounds. They claimed that it would increase the price of bread.

As weights and measures men we are interested in seeing that the public get what they think they are paying for. The average housewife believes that she is purchasing a 16-ounce loaf when she purchases a small loaf of bread.

Last Thursday I had one of my inspectors go out and make a hurried survey of how bread is sold in the city of New York to-day, and before I read the results of this investigation I want to say that I do not believe that any reputable firm, whether it is a bread man or any other man, is engaged in business for the purpose of defrauding the public. I believe that the bread men of New York City—and in my opinion that applies to every reputable concern engaged in the bread industry—are endeavoring to give a proper commodity of the right quality to the consuming public; but we weights and measures men are engaged in trying to place that in-

dustry on a uniform basis not only in the State of New York but throughout the country.

Let us first consider the large baking establishments. One of the largest bakers in New York is selling a wrapped loaf, a small-sized loaf, for 9 cents. Eight loaves show an average weight of $13\frac{11}{16}$ ounces. The loaves of another large manufacturer average $14\frac{13}{16}$ ounces. Still another averages $14\frac{1}{8}$ ounces; a fourth, $14\frac{3}{4}$ ounces; a fifth, $14\frac{9}{16}$ ounces. These loaves of bread are sold when wrapped at 9 cents and unwrapped at 8 cents.

Turning our attention to the chain stores, one such company sells unwrapped loaves of bread for 7 cents, and they weigh $14\frac{1}{4}$ ounces. Another sells unwrapped loaves for 7 cents, and these weigh $15\frac{11}{12}$ ounces. Still another company sells unwrapped loaves for 7 cents, and their average weight is $14\frac{11}{12}$ ounces.

The small bakers—and we have approximately 4,000 of them in the city of New York—as a class charge more for their bread than the wholesalers. One small baker charges 10 cents for a loaf of an average weight of $15\frac{1}{8}$ ounces; another, who charges 10 cents for his loaf, averages $15\frac{6}{7}$ ounces; still another baker, having an 8-cent loaf, supplies one averaging $13\frac{5}{12}$ ounces; a fourth, with an 8-cent loaf, averages $14\frac{7}{12}$ ounces. Here are three distinct groups engaged in the bread industry in the city of New York, and there is no uniformity in price or in weight.

We are vitally interested, and I know that you are too, in the securing of weight standardization in the manufacture of bread. The large wholesalers claim that this would increase the price of bread. How is it, I would like to know, initiated though I am in the bread industry, that one large baker turns out a loaf weighing $13\frac{11}{16}$ ounces and another, one of the largest bakers in the United States, turns out a loaf averaging $14\frac{3}{4}$ ounces, the price of both loaves being the same? How is it that a man operating a chain of stores can turn out a loaf of bread unwrapped for 7 cents, 1 cent cheaper than the price charged by the large bakers, and yet maintain his loaf at a weight of $15\frac{11}{12}$ ounces?

I present these things to you, and I present them to the representatives of the bread industry who are present here this morning. Is it possible for the bread bakers of America to get up a 16-ounce loaf without increasing the price? I believe it is, if one large baker can give an ounce more than another, for I do not believe that the overhead in one big plant is any greater than in another similar one. If we can bring about uniformity—a 16-ounce loaf of bread—we will be saving to the housewives of America a tremendous sum annnally, and I believe we will not impair the financial standing of any large bread baker.

I believe, too, that the representatives of the bread industry should be foremost in working for the weight standardization of bread. They speak of the fluctuation of prices owing to the fluctuating costs of the products that enter into the manufacture of bread. Reference has already been made to the milk industry, where we have standardization in the bottles and where we have fluctuating prices from month to month, sometimes ascending and sometimes descending. If the milk industry can conform to standardization, surely the bread industry can, too. But I want to say this: Before you introduce your bread bills in the next legislature it would be advisable for you

to take up this question with your governor before the end of this year and place the facts before him, so that he may incorporate them in his inaugural message at the opening of the sessions of your State legislature. If we can get bread legislation as a policy of the governors of the States, we can go forward faster than if we wait for the opening of our respective legislatures and then try to secure such legislation through the committees. With the power of the governor behind us we can secure legislation where, without it, it would be almost impossible.

I make this point, because if we have six, eight, or a dozen States working together at the same time in 1922 there will be far greater and better results that way than if we worked haphazardly. We ought to have a comprehensive program; we ought to have a program of unity; and in following along this line of taking up this question in November instead of January or February or March, there is more likelihood of securing the results that we are seeking. I thank you.

Mr. RABENOLD. I want to assure you, gentlemen, that I came here to listen rather than to be listened to. But I do think, Mr. Chairman, that the president, the presiding officer initially, voiced the attitude which the baking industry certainly has toward this question. We invite conference; we solicit expression of views, and all we expect in the foreground of any discussion is the assumption that, whether we are right or wrong, we are talking with sincerity; we are talking what we at least ourselves believe to be right, and that questions of petty advantage or of personal selfishness or of self-aggrandizement are pushed into the background as far as they can be pushed.

On that plane I want to respond to a few suggestions that have been made to-day. The baking industry is vitally interested in this question. I am speaking here to-day to a group of officials charged with the duty of enforcing weights and measures laws, and I certainly appreciate this opportunity.

The baking industry may be wrong, but it is at least honest in its views. At the forefront of any discussion here there is after all a certain burden of proof, is there not, upon the official or other proponent of legislation that changes the *status quo?* That is the ordinary situation. The man who proposes something new or who would change an existing situation is ordinarily called on to show some reason why there should be such a change made.

It seems to be assumed that bread should be sold by standard unit weights. It seems to be assumed that the housewife expects to receive a pound in the loaf. It seems to be assumed that there is no variation in these loaves of bread that Mr. Holwell speaks of except the variations of price and variations of weight. We challenge all those assumptions.

We ask weight and measure officials, "Why should a loaf of bread necessarily be a pound?" And, driving weights and measures officials to an answer, the only answer that I have been able to derive ultimately was a certain facility of enforcement of a statute. And that cropped out, as you observed, in Mr. Holwell's talk.

There is strength in that proposition. I have always conceded that. But after all that is an adjective matter. It is a more or less formal matter. The substance of the matter is, why should bread

be sold in units of a pound? Does the housewife demand it? We have never heard of any demand of that character. If we are wrong about that, it is going to be very easy to demonstrate it. We have never yet found a housewife or any consumer who tested bread by weight. If we are really wrong in that statement—that no housewife weighs bread; I mean, judges bread with reference to the weight of the loaf—then we must revolutionize our baking industry. Then we must go in simply for quantity production rather than quality production.

The whole effort of the baking industry from the earliest days in this country has been directed toward quality production. If the housewife does not care about quality, or if there is something that she cares about more than quality, why we are just all wrong about that. But we certainly want to be put right.

On the assumption of quality, what is the answer to most of the questions that Mr. Holwell has asked? He says, "Why is there no uniformity in weight, why is there no uniformity in price?" The answer is, "Because there is no uniformity in quality." We are dealing, therefore, with variables; we are not dealing with constants. I say we challenge the assumption that there is any requirement that bread should be sold in a particular unit of weight, and we challenge the second assumption that the housewife expects a pound loaf.

The fact is that the chain stores, referred to here, as well as the larger bakers, are advertising their weights. I was recently in St. Louis, and there, upon the front of the plate-glass window of one of the chain stores, I found not only the price of the loaf advertised but I found the weight of the loaf advertised. But I find nothing upon which to support the assumption that the housewife when she buys a loaf of bread has any expectation that the loaf weighs a pound. And yet, don't you see it is that assumption upon which all this loose talk of cheating is based?

Any attorney will tell you that the elements of deceit or fraud are, first, a representation; second, a failure to stand up to the representation; and, third, a reliance on that representation. And on those three elements alone can you base deceit or fraud. I am not standing sponsor for every member of the baking industry. No. I am speaking in broad terms of general conditions—the only thing you can face here to-day. I am not defending any particular baker who may have reprehensible business practices. But you must legislate, if you do, broadly for the entire industry and the entire country. And where we find a particular instance let it be dealt with in and of itself, instead of seeking to throw any aspersion on the seventh industry in the United States.

With respect, now, to the question of fluctuating weights as contrasted with other commodities, comparing bread, for instance, with milk. There is a very obvious distinction that is a necessary result of what I have said about the variable character of quality. Milk has reached into the category of standardized products. We have in New York City a "certified" milk, we have a "grade A," we have a "grade B." That grading is done under public supervision in accordance with well-defined tests. Now, what is milk? Milk is a combination of water, fats, and certain other chemical elements, all of which are exactly gauged in the product. You can test milk immediately

after production or a day after production, but you can not test the quality of bread.

I submit to you men that until you have made some little nearer approach to a standardization of quality you can not begin to compel a standardization of weight unless you want to do the arbitrary thing; and it is against that arbitrary thing that the baking industry protests as vigorously as it may, in the interest of itself, true, but in the interest of the consuming public, as to which we must have a very jealous and a very intimate regard.

There has been no complaint of gouging, there has been no complaint of overcharging. Quite the contrary. You can ask Mr. Hoover when he comes here to-morrow to repeat to you men what he stated publicly in Atlantic City last fall, that the baking industry above every other industry was freer from any attempt even of imposing on the people of the United States during war times than any other industry in this country. So we are not asking any favors.

I submit here this morning simply this: You men as public officials under democratic institutions and the spirit of our laws are not interested in sumptuary legislation referring to an antediluvian past. Notwithstanding what Mr. Holwell has suggested, don't let this question of weights legislation become linked up with any consideration of whether the bakers can or can not give more bread for the same money. Don't let this subject, on the other hand, become linked up with any question of standardization of kind until there is such a thing as standardization of kind.

What is left? The only question left for you to discuss—the only question that is properly within your province—is to protect the public against any misrepresentation, and in order to protect the public against misrepresentation you must first have a representation. So I say get your representation. I will help you get a law, in the absence of any law at all to-day, which will compel a baker to make a representation as to what he is selling. That representation may be in the form of a standard loaf. I have no quarrel on that score at all except I would not stop there. For fear that you may arbitrarily impose a limited requirement we present to you the advisability of permitting an alternative. Let the baker who wishes to make representation in the form of a standard loaf weighing a pound do so. But if there are bakers—if there is only one baker, and much more if there are 4,000 bakers—who desire to make their representation of weight or quantity in connection with price, to make that representation in the form of a weight label on the unwrapped loaf, in the form of a printed representation on the wrapper of their wrapped loaf, let them do so.

Is there any reason why they should not be permitted to do it, if the only object of the legislation is that the public shall be informed as to what they are buying? There is no public need even of that, may I say. But we will take your own assumption there. We will take your assumption that the public does want to know what the weight of the loaf is, although we do not believe it at all. We say we are perfectly willing to tell it. If you want the representation in the form of a standard loaf, we will do it; but give us the alternative where the conditions may require the alternative to be adopted, namely, the weight of the loaf if it differs from the standard weight. We say that meets every public requirement that properly enters into

this question. And on that score we submit that we will find the baking industry unanimous. We trust we may find you unanimous, and the public will be served.

Mr. CUMMINGS. With your permission I would like to ask one question of the gentleman representing the bakers. Assuming the correctness of your contention that the only valid argument in favor of standardization of the bread loaf would be the facility of law enforcement, would the establishment of such a standard operate against free competition on the basis of quality and price?

Mr. RABENOLD. I think a group of public officials should not be interested primarily in whether it is good or bad for the baking industry. Their whole consideration should be whether it is good or bad for the public. But to answer your question, which is directed rather to the internal operation of the baking industry, may I say that one of the powerful arguments that has been made internally within the ranks of the baking industry in favor of the standard weight is that, if you fixed the weight of the loaf, it would repress unfair competition among bakers.

Mr. CUMMINGS. If the standardization of the loaf would be a good thing from the weight and measure official's standpoint, and it would not be a real bad thing from the baker's standpoint, why it seems to me there would not be any force in the argument against the enactment of a law for the standard weight.

Mr. RABENOLD. If that were the whole story the conclusion would follow. However, it seems the sense of the baking industry is that there would be a real harm inflicted upon the industry by having standardization of unit weights of bread. I speak with hesitation in terms of conclusion on that, for the committee that is here in response to your invitation received only one instruction—it could receive only one instruction—and that is to merely inform this conference that this question, which has been debated a great deal, will come formally again before the board of directors of the American Association of the Baking Industry on June 16. It is also anticipated that it will be the first order of business at the annual convention in September, at which time I hope I will have an answer to the question as to what the baking industry of the country, speaking generally, considers its own relationship to this question.

Mr. SCHULTZ. We have a bread ordinance prescribing that bread must be baked in loaves weighing not less than 1 pound. They sell that 1-pound loaf for 10 cents. Then, the next size is sold for 15 cents, and we find that the 15-cent loaf runs only from 20 to 22 ounces. The people naturally expect if they pay 10 cents for 1 pound that the bakers, having the same overhead on a pound and a half loaf that they have on a pound loaf, could give a pound and a half for 15 cents and the housewife expects at least a pound and a half.

Mr. MCGRADY. The bakers are very careless in Pennsylvania, where we have no bread law, as to the uniformity of weights. In 1912 or 1913 I made a survey of certain bakeries in Pittsburgh, weighing approximately 100 loaves of the bread of each firm. I will not attempt to give you the details of the weights, but the "low" was 11 ounces and the "high" was close onto 16 ounces.

Mr. MOTE. The gentleman in his remarks—and I must say that the bakers' views were very ably presented by him—challenged the contention of the weights and measures men as to whether the housewife

wants a standard loaf of bread. I assure him that every housewife's league in the State of Ohio was behind the bill which passed the Ohio Legislature two weeks ago standardizing the loaf of bread.

We have a law now standardizing bread to 1, 1½, 2, 3, 4, and 5 pounds. Also, a number of cities in the State of Ohio already regulate a standard loaf of bread by city ordinance. In one city in the State of Ohio a 1-pound loaf was being baked to sell for 10 cents, and that same baker was baking a 13-ounce loaf and selling it beyond the city limits for 10 cents. I would like the gentleman to explain why that took place.

Mr. Rabenold. Nobody can tell me a baker can manufacture a 16-ounce loaf of bread at the same cost as a 13-ounce loaf.

Mr. Holwell. How is it that one baker sells a lighter loaf than another?

Mr. Rabenold. The only assumption I can make is that the one is making such a good loaf of bread that people are ready to buy it at a less weight at the same price they pay for others.

Mr. Holwell. I was raised on the heavy loaf and I still stand by the man that makes it.

REPORT OF SPECIAL COMMITTEE.

Mr. Schwartz. In reporting for the committee appointed yesterday to visit Mr. Fischer, I will state that we went there after the adjournment of the conference and found Mr. Fischer sitting up, feeling quite cheerful, and regretting exceedingly that he was unable to be present here, not only to greet the old members of the conference but also those who have come in this year for the first time. He was very grateful indeed for being remembered, sent his sincere regrets, and trusted that we would have the usual good time.

(Whereupon, at 12.35 o'clock p. m., the conference took a recess until 2 o'clock p. m.)

FOURTH SESSION (AFTERNOON OF TUESDAY, MAY 24, 1921).

The conference reassembled at 2.30 o'clock p. m., Dr. S. W. Stratton, chairman, presiding.

ENFORCEMENT OF LAW IN RE MARKING OF WEIGHTS ON WRAPPED MEATS.

By H. Runkel, *Bureau of Chemistry, Department of Agriculture.*

I am very sorry, indeed, that Dr. Alsberg is unable to address you on this subject, for I believe he would have given you something that would have been worth while. I do not feel that I am able to more than give you a few details, but what I say may possibly open the subject for discussion and bring out some points on which you can exchange your own views.

The passage of the Kenyon amendment on July 24, 1919, describing the interpretation of the word "package" as used in the so-called net-weight amendment of the Federal Food and Drugs Act as including wrapped meats, has been a distinct advantage to the Bureau of Chemistry in the interpretation of the word "package." Our cases have included a wide variety of products, among which are cans of cottonseed oil, sacks of cottonseed meal, jars of cheese, baskets of grapes, bottles of sirup, cartons of macaroni, and many other products in similar containers. Although a large number of cases on a large variety of products have been made none have so far been contested in such a manner as to give the Bureau guiding principles on which to interpret the word "package." The nearest approach to such an interpretation has been the congressional action requiring wrapped meats to be considered as packages within the meaning of the act.

As Dr. Alsberg has told you at previous meetings of this conference, the Food and Drugs Act has many peculiarities which are not common to State and city weights and measures laws. One of these peculiarities is a stipulation that the crime committed is the shipment of adulterated or misbranded food in interstate commerce rather than the actual adulteration or misbranding. This stipulation makes it necessary that we proceed against the interstate shipper. In many cases the interstate shipper has purchased the goods in package form from a local producer. In the development of the case the shipper almost invariably introduces as an excuse for his violation of the law the fact that he purchased these goods from a local man. In making this excuse he infers that we should place the responsibility upon the local producer, and in many instances it appears only just that the responsibility be so placed. The law provides, however, that the shipper shall not be prosecuted if he can produce a guaranty given to him by the local producer that the goods sold are not in violation of the Federal Food and Drugs Act.

In sales of ordinary fruits and vegetables such a guaranty is seldom given. It is inconvenient to the producer to give this guaranty, and the movement of the goods is so fast, due to their perishable nature, that such matters are usually overlooked. In the case of meat sales this difficulty is not nearly so great, since the packing and sale of meats are usually conducted in a well-organized establishment which is familiar with the requirements of the law. Such establishments usually have legal departments which advise them very specifically and carefully in regard to the legal requirements which it is necessary for the establishment to meet in making its interstate shipments. This feature of the law would probably not interfere so often with the placing of the responsibility for the marking of the quantity of contents on packages of meats which are shipped in interstate commerce.

Another feature of the Federal Food and Drugs Act which must be taken into consideration in the enforcement of the net-weight section of the law is the multiplicity of activities which may be undertaken under the act. For example, on weight alone we have the Kenyon amendment in regard to the marking of weights on packages of meats, we have the Gould amendment requiring that the quantity of contents be marked on all packages of food which fall within the jurisdiction of the law, and we have a general paragraph stating that the term "misbranded" is applied to all articles of food the package or label of which bears a statement, design, or device regarding such article which is false or misleading in any particular. Action is taken for short weight under this latter section of the act. In addition to these sections of the act which deal with weights and measures, the act is so constructed as to deal with products so adulterated as to affect the health of people and deals with frauds and unfair competition in connection with the adulteration or misbranding of any type of food or drug.

The facts that the scope of the act is so broad and that it deals with shipments in interstate commerce bring a type of cases involving health to United States attorneys and United States courts which are more serious in their effects upon the public than the cases involving fraud. The dockets of the various courts are usually crowded with a number of cases of a more serious type than those involving a failure to declare the quantity of contents. It has therefore been found that unless a net-weight violation is affecting a large number of people and proof can actually be presented that the people are being defrauded by a certain type of declaration or the failure to make a certain type of declaration the United States attorneys and courts are loath to consider such cases in preference to those involving the health of the public. This tendency on the part of the attorneys and courts is not surprising and, no doubt, is proper. This matter is not pointed out, however, to belittle the net-weight cases, as it is well known that frauds of extensive proportions are perpetrated on the public by failure to declare the quantity of contents as well as by giving short measure. The thing that we have to keep in mind is the presentation of evidence to the district attorneys showing that the violation of the law complained of is one of serious moment and one which must be taken cognizance of by United States courts before the violation will be discontinued.

The matter of collection of proper evidence has been taken up simultaneously with the question of education. It is well known that educational work is not the most effective way in which to secure a compliance with the law. Writing letters to a man to tell him that he is violating a law is without doubt the simplest method of education and probably the least effective. It is very hard for an official to have the patience to write him a letter telling him that he is violating the law when the official knows that the action which will secure best results is prosecution.

In connection with net-weight cases under the Federal Food and Drugs Act educational work is not necessarily lost because it gives an opportunity to collect evidence which can be presented to the district attorney showing him that the practice complained of is of some moment and should be taken cognizance of by a United States court.

In the normal development of net-weight cases in the Bureau of Chemistry the type of violation is studied, and if of more or less technical nature educational campaigns are planned for the purpose of bringing the requirements of the law to the attention of the shipper. These campaigns are followed by another campaign of citation to a hearing, in which action by criminal prosecution is taken against more flagrant violations by the shippers who have been previously warned. This campaign is followed by seizure action if the situation warrants it. In each step the evidence of the seriousness of the violation has been collected in the previous step. The application of this scheme to wrapped meats has not been necessary so far because the packers have been willing and ready to comply with the law.

Soon after the Kenyon amendment was passed the bureau got in touch with the Bureau of Animal Industry. It was soon found that although Congress has interpreted the word "package" for us, there were further difficulties in determining how far we could go in holding that wrapped meats were packages. When a ham or a piece of bacon is wrapped with cloth or paper as an individual unit and tightly sealed, there can be no question as to whether it is a package within the meaning of the act. This type of product gave no trouble. However, hams, bacon, and loins of pork are often loosely wrapped with a piece of plain paper for sanitary reasons, and a number of these individually wrapped cuts are inclosed in a shipping case. After considerable discussion of the interpretation of the law with the legal office of the department it was decided that wrappers of loose, plain paper were not considered as wrappings in the sense that "wrapped" is used in the Kenyon amendment, and that such individual cuts of meat inclosed in such plain loose wrappers were not packages within the meaning of the amendment and need not bear a statement of the quantity of contents. It was decided, however, that if such loose temporary coverings bore other printed matter or labels a statement of the net weight must be applied. Appropriate instructions were issued by the Bureau of Animal Industry regarding this requirement.

In connection with meats shipped in crates the question arose whether or not such crates were packages within the meaning of the Gould amendment or the so-called net-weight amendment. The question was brought up by some complaints from various sections

of the country that meat was being sold in these crates, which crates were marked with three separate distinct figures, one of which referred to the number of cuts, one to the gross weight, and one to the tare weight. It was reported in these complaints that the meat was being sold at a weight which included the loose wrappings around each individual piece, amounting in some cases to more than a pound on a 100-pound crate. This led to the question of whether or not the net weight should not be marked instead of the gross and tare weights.

It was found upon investigation of the records and invoices upon which the sales were made that the packer made the statement in the printed matter on the invoice that the weight as invoiced included the weights of wrappers. The bureau has no authority to control the manner in which products are invoiced, but it can control the method in which packages of meat are marked. The bureau is also supported in this matter by the Bureau of Animal Industry. As a corrective measure the Bureau of Animal Industry had this question up some years ago and published in its Service and Regulatory Announcements for December, 1916, a ruling stating that the word "net" was held to represent the weight of the meat exclusive of any wrappings or linings. According to this ruling of the Bureau of Animal Industry the statement of the tare weight included the weight of the wrapping. This question also brought up the matter of shrinkage.

It is a well-known fact that meat will shrink in transit. The amount of this shrinkage is probably not so well known. The bureau has now made arrangements to conduct experiments to determine the shrinkage of meat during transportation. It is hoped by the end of the next fiscal year to have some very valuable figures on this subject. The bureau has conducted a large number of shrinkage experiments in connection with other products and has used this information to assist in winning a number of cases on shortage in weight. It is believed that the information on shrinkage in weight of meats will serve the same purpose.

The question of shrinkage has not been taken up previously for the reason that the bureau maintains very amiable cooperative relations with the Bureau of Animal Industry. That bureau maintains a field inspection force, which can be called upon to investigate practically any problem in connection with a meat-packing establishment.

When complaints are raised in regard to the weight shortage of meats the question immediately arises whether the shortage is due to original short packing or shrinkage. In such cases the complaints are referred to the Bureau of Chemistry, who in turn takes the matter up with the Bureau of Animal Industry, who investigates the factory at its source to determine whether or not a practice is prevailing at this establishment to cause a shortage in weight. This arrangement has sufficed up to the present time to bring about better attention to the matter of weights by the packers. There is no doubt but that the arrangement is very efficient and produces exceptionally good results, in view of the fact that there is a man on the job all the time at the originating establishment. This arrangement, however, does not take care of complaints which may be made to local sealers of weights and measures. There is no doubt but that com-

plaints are made to them which should be investigated, and if they had information in regard to shrinkage they would be able to determine whether or not action would be justifiable.

The bureau is always glad to lend any assistance possible in making prosecutions of this type, and when the shipping experiments have been completed the results will be available to any official who may have use for them. It is possible that some of the State laws do not require that shrinkage shall be allowed on packages of meats shipped into their several territories. If such is the case, the bureau can see no objection to the requirement of the local sealers of weights and measures that the package be re-marked in accordance with their local laws.

The Bureau of Chemistry would be unable to take any action against packages of wrapped meats which were correctly marked as to weight at the time the product entered interstate commerce. If it can be shown that at the time the package entered interstate commerce the marked weight was not correct, the bureau would have authority to take action. However, any shrinkage subsequent to that time would have to be allowed for. In case the local men feel that they would prefer to take action under their own law, any of our field stations which are located at various cities in the United States would be glad to lend any assistance in their power in developing such cases. It might be pointed out in this connection that the Federal Food and Drugs Act permits any State health, food, or drug official to submit information to the United States attorney in regard to a violation of the Federal Food and Drugs Act. Arrangements are made through our office of cooperation, now under the direction of T. F. Pappe, to lend all possible assistance to any sealer of weights and measures or other food official in making such case under the Federal Food and Drugs Act. It has been the practice of our bureau to commission the State sealers of weights and measures as food officials, who may operate directly under the Federal Food and Drugs Act. There has been, however, some difficulty in commissioning local sealers of weights and measures for the reason that it is doubtful if the law contemplated commissioning these officials. However, that need not deter any local sealer of weights and measures from beginning action by reporting the facts to the United States attorney if he so desires, and I assure you that Mr. Pappe's office will lend all the assistance in its power in bringing such cases as seem desirable under the act.

I wish to solicit from you all the cooperation that it is possible for you to give and assure you that we will make every effort to reciprocate. It is possible that you will be able to bring cases under your own laws with as much success as under the Food and Drugs Act. However, if you will bring the violations which come to your attention to the attention of our field men I am sure we will together be able to bring about corrections of malpractice in your own territories and will be of service both to the local and to the national population. It is our mutual aim to work to protect the public, and if such protection can be brought about by cooperative efforts I am sure you will find that the Federal Food and Drugs Act is a tool in your hands which will assist to bring about such protection.

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DISCUSSION OF ABOVE PAPER.

Mr. WEBSTER. May I be permitted to ask Mr. Runkel a question referring to that part of his address relating to the marking of crates? I understand that the bureau ruled that the net weights should be indicated upon the packages themselves; for instance, in the case of pork-loin boxes you did not state in your address whether that provision had been adopted or not.

Mr. RUNKEL. I believe that your understanding is correct.

DETECTING SHORTAGES, SECURING EVIDENCE, AND PROSECUTING OFFENDERS.

By R. F. BARRON, *Commissioner of Weights and Measures, State of Minnesota.*

It is recognized by every official charged with the enforcement of weights and measures laws that the prosecution of violators of those laws is one of the most delicate as well as one of the most important problems which he has to solve. Some offenses are of so flagrant a nature that there can be no doubt of the advisability of prosecution, while again we find many technical violations which while they are classed as misdemeanors by the law are of such a nature that an inspector would hardly be justified in prosecuting. Between these two extremes we are continually being confronted with many cases, each of which must be settled on its own respective merits, and no complete and rigid specifications can ever be adopted which will satisfactorily cover the subject of short weight or measure prosecutions.

Personally I feel that a vast majority of the men in business to-day are reasonably honest in their dealings with the public, either because it is their nature or because they realize that petty dishonesty is very poorly rewarded. There remains no doubt whatever in my mind that every line of commercial endeavor has its small percentage of out-and-out crooks, and the bulk of supervision work must naturally be aimed at such parties.

We must not overlook, however, the fact that there is a much larger percentage whose indifference and carelessness lead to frequent violations of the statutes, and the man who uses a counter scale an ounce or two out of balance, or who operates a pump he knows to be wrong and says, "I did not have time to look after it," is entitled, in my opinion, to very little consideration. In checking coal and ice deliveries we find surprising variations, and while we realize that the officials of the company in general do not countenance the practice of short-weighting their customers nor profit by the saving made our rule is to hold the company liable unless it can be shown that a reasonable effort to protect their customers has been made, and that the proper amount of supervision work, which alone will insure their employees' carefulness and honesty, has been done.

Most of the prosecutions in our State result directly from the investigations made following complaints filed by either customers or competitors, although, as a rule, it is not possible to secure the cooperation of the injured party in securing evidence. The checking of coal and ice deliveries, peddler wagons, and package goods present no very difficult problems to the active inspector and only require the exercise of due care in ascertaining and verifying his weights.

The hardest proposition to handle, in our experience, is the grocer or meat dealer who makes a practice of taking from 2 to 5 cents on each sale and thinks to escape detection because of the small amount involved in each case. Courts are inclined to be lenient with a merchant appearing in answer to a complaint alleging that he delivered a piece of meat an ounce or two short of the weight charged for. It is difficult, of course, for the local sealer or inspector to secure evidence himself against such concerns, and we find that it is occasionally necessary to call on inspectors from other districts to work where they are not known to the merchants. We find this practice preferable to taking as evidence purchases made by persons not familiar with the work, as inexperienced witnesses are very apt to make a poor showing if the defense is ably handled. In a recent three-day drive with two inspectors we were able to secure six convictions against one meat dealer and three against another, and a judge who had never before taken these small shortages seriously assessed fines aggregating $225 and warned the dealers that the next appearance meant a trip to the workhouse. Some judges are hard to convince, but, giving credit where credit is due, I must say that in general we have found the courts very fair, and in St. Paul especially the maximum fine is assessed far more frequently than the minimum.

It should be borne in mind at all times that a case which is dismissed or which results in an acquittal because of weak or faulty preparation on the part of the inspector tends to reflect on the department under which he operates and will not raise him in the estimation of the judge before whom he may have frequent occasion to appear. It therefore behooves the inspector to use extreme care not only in preparing his evidence but in seeing that his complaint is properly drawn and charges only what he is prepared to prove.

It was rather embarrassing to an inspector from our department some years ago after naming a certain grocer as defendant in a short-weight complaint to be informed that the party had been dead eight years and could not be produced on such short notice. Quite recently one of our best men named as defendant a respectable lady who, while still the owner of record, had no trouble in proving that she had disposed of her interests over six months previous to the date of the alleged offense. Neither of these mistakes prevented successful prosecutions of the guilty parties, but did occasion needless trouble and waste of time and incidentally gave the critics an opportunity to be heard.

We have found it advisable in some instances to avoid in the complaint a statement of the exact shortage found, especially when such commodities are involved as gasoline or ice, where there is a constant change in volume or weight and the inspector's figures would not represent the actual amount delivered, even though the variations would be small. The complaint in such cases is made that the defendant sold a quantity less than he represented, and the figures can be presented as part of the evidence and can then be more easily explained and substantiated.

The practice of making a complete record at the time the investigation is made is strongly to be recommended, and no more reliance should be placed on memory than is necessary. The memorandum can be qualified as an exhibit and used to refresh the inspector's memory, as well as being in the terms of the law "best evidence."

Only a couple of months ago one of our younger inspectors under a stiff cross-examination became confused in his figures, and it was only the introduction of the State's exhibit "A" in that inspector's handwriting that saved the day.

Too much stress can not be placed on the importance of making "assurance doubly sure" when the question of the accuracy of the apparatus used in determining the amount of shortage is involved. Even when the commodity is checked back on the dealer's own scales and the seal on these scales shows that they were correct within the allowable tolerance at the time of last test, a further test should be made immediately or the results obtained in the first instance verified by weighing on other scales, so that no reasonable doubt could exist as to the accuracy of the weights. In any case it is very necessary to retest the dealer's scales, so that it may be known whether the shortage is the result of a faulty scale or carelessness or intent on the part of the vendor.

Frequently, of course, it happens that the time spent in perfecting a case to make a presentable showing is apparently wasted, but even though an inspector may feel certain that a plea of guilty will be entered he may be certain that the first sign of weakness on his part will be the signal for a bitter fight on the part of the defendant.

Occasionally a touch of humor enlivens the routine of court procedure. Within the present month the driver of a peddler wagon was arrested on a short-weight charge. When he appeared before the judge, the clerk accidentally picked up the wrong file and read a complaint charging the poor short-weight artist with beating his wife. Somewhat surprised at the unusual turn of events, but bothered, no doubt, by a guilty conscience, the defendant entered a plea of guilty to that charge, and only the intervention of the inspector saved him from a trip to the workhouse.

It is on record in our State also that on one occasion an inspector usurped the duties of prosecutor, counsel for the defendant, and justice of the peace in addition to his own work. A report was received at the office from a disgruntled driver charging that the coal dealer for whom he had worked was making a practice of selling 1,900 pounds of coal to the ton. The inspector sent to investigate secured a full confession from the dealer, and public sentiment in that small town was quickly aroused. Fearing that his prisoner would be treated to a coat of tar and feathers if he appeared in the town hall, the officer assessed a fine of $300, secured a written agreement from the merchant to the effect that restitution would be made in all cases to the injured purchasers, then swore out three complaints, presented the State's case on behalf of the department, entered a plea of guilty for the defendant in each case, and paid the maximum fine of $100 and costs for each offense.

The judge's astonishment in that case was perhaps no greater than that of an inspector in the northern part of the State who found a general merchant using a pump which had been rejected the previous day and on which no repairs had been made. Upon inquiring where the nearest justice of the peace could be found the inspector was informed that the party he wished to prosecute was the nearest qualified justice within 20 miles. Inasmuch as both the merchant and the inspector were reasonable men, it was agreed that the justice should take official cognizance of his own offence and he proceeded

forthwith to fine himself $20 and costs. The fine was remitted to the office the same day, and we believe that our record on that case stands unique among weights and measures prosecutions.

In still another case where the manager of a creamery pleaded guilty to a charge of exposing for sale short-weight butter prints the judge assessed a fine of $50 against the company and then astonished the inspector by remarking that he owned more than 50 per cent of the stock in that concern and wanted to do business right, and further stated that the manager could take official notice that his services would be no longer required at that creamery.

Getting back to the more serious side of the question, I have had two experiences in the past few months which convinced me that the plea so often heard, "We don't care about the fine, but we do want to avoid the advertising," is a serious matter in some cases. A daylight raid on a coal yard resulted in exposing the company's practice of sending out the early loads light weight. The sales manager learning of the investigation rushed to the office to explain that he had recently secured the business of over 100 concerns that transferred their accounts when the firm with which they had been doing business had paid a fine for short weight, and that all of this business and much more would be lost if their company had to appear in court on the same charge. I expect the business was lost, as the judge assessed the maximum fine on two counts and the papers published the names and facts with unusual accuracy.

The other incident occured the same week and again involved a coal company. This company had pleaded guilty a few weeks before on two short-weight charges and were apparently in a hurry to make up the amount of the fine, as the first load checked by our inspectors following the convictions was over a thousand pounds short. The officials of the company were beginning to realize that their competitors were making use of the prosecutions to induce their trade to leave them, and every effort was made to have the third case dropped. Failing in this, an offer was made to pay $5,000 if the complaint was brought against the weighmaster instead of the company. In both of these instances I have every reason to believe that the short weight was deliberate and intentional and would not feel at all bad if neither company ever sold another pound of coal in Minnesota.

When we realize that only a few years ago such concerns could carry on their unfair practices with very little restriction, and that the honest competitor and the unsuspecting public alike were practically at their mercy, we can not help but feel that the work we are doing has a very important place in the economic life of the Nation, and we still look hopefully forward to the time when those two words, "weight" and "measure," will receive from the general public the consideration which we know their importance deserves.

DISCUSSION OF ABOVE PAPER.

Mr. Bellis. I would like to ask whether there was found any short weight in seed. In my territory I know of one case where a merchant bought $4,000 worth of seed corn, and the shrinkage and the damage amounted to over $800, which he succeeded in having returned.

Mr. Barron. I do not believe our troubles in Minnesota are as great in that respect as in other places. Most of the feed and flour sold in our State is put up in Minneapolis, and I must say that the millers in Minneapolis are possibly the most careful and most accurate users of weighing equipment of any large industry in the country. We find a surprising shrinkage in some feeds, and we know from experience that the shrinkage is large on some feed shipped in by other States. We also find considerable loss from poor sacks and loose containers. But in general we find that the feeds and feed stuffs that are put up by the larger concerns in the larger places are reasonably correct, but that it is with the feed that is shipped out from the smaller towns in Minnesota, where it is probably weighed over some old wagon scale in wagonload lots, that the trouble occurs.

Mr. Ziemer. I would like to ask if any inspectors have any trouble in short weight on Portland cement and if anyone has made any investigation. We have had a great deal of trouble with the contractors in Lincoln. One man told me he averaged 16 pounds short to the sack.

The Chairman. I would suggest that you take that up with the Cement Manufacturers' Association. It is a very reputable association, and I do not believe they would tolerate that for a moment on the part of one of their members.

Mr. Ziemer. I have done so to a certain extent, and they say they expected to furnish 88 to 90 pounds, yet it ran 74 pounds.

Mr. Mote. In that connection I want to say that in the State of Ohio we found one car of cement that ran over 1,000 pounds short in weight. Those sacks were marked 94 pounds net, and some of them contained as low as 68 pounds. Upon taking the matter up with the manufacturers they were very willing to adjust the matter, which they very promptly did, and asked that a representative of our department come to their factory. We found they were using automatic filling machines. The men operating them were working on piecework and a number of sacks were being taken off the machine before the machine tripped. They put in a check weighman and there has been no trouble since.

Mr. Miller. We had a similar experience in Indiana. On one carload of cement coming from a concern in Illinois we found that all the sacks we checked were running from 3 to 7 pounds short. We took it up directly with the company and they made adjustments and thanked us for calling the matter to their attention.

DESTINATION WEIGHING OF COAL FROM THE STANDPOINT OF THE OFFICIAL.

By T. L. Irvine, *Superintendent of Weights and Measures and Oil Inspection, Salt Lake City, Utah.*[5]

In presenting this subject I will confine myself to conditions as I find them in the west, although the same conditions, no doubt, prevail to a greater or less degree throughout the Nation. The necessity for national legislation which will compel railroads to give to the consignees destination weight on coal shipments is a theme which should command the immediate attention of every weights and

[5] In the absence of Mr. Irvine this paper, prepared by him, was read by F. S. Holbrook.

measures official, as well as every citizen who is interested in fair dealing. When the seriousness of the matter is carefully considered, it will seem almost preposterous that remedial legislation has not long since been enacted.

The railroads have persistently fought the efforts of those vitally interested in such legislation and through their well-organized lobby have been eminently successful, at least so far as Utah is concerned. It is true that the statutes of Utah indicate that such a law has been passed and is a matter of record, but so far as the enforcement of the law is concerned it may as well have never been enacted. I have been informed that up to the present time not one car of coal has been weighed under its provisions.

It is common knowledge that a very large proportion of the cars containing coal and being delivered to the yards of the dealers are under weight. This shortage is occasioned from various causes. In the first place, the mines are working only part time, for which reason the cars are loaded far beyond their capacity in order to increase tonnage. Owing to the overloading the coal spills from the cars at the mine tipple and lodges on the scale and is allowed to accumulate until it becomes a nuisance, when it is loaded on a wagon and delivered to the boiler house or to the private residence of some employee who pays the mining company a nominal sum for the same. This accumulation on the scale is weighed with each car and is charged against the consignee just as if he had actually received the coal, when quite the opposite is true. When switching these overloaded cars at points along the line, much coal is lost through being shaken off.

Quite frequently inaccurately marked tare weights of cars are used, which in most cases cause a considerable discrepancy which works to the disadvantage of the consignee. People living near the railroad at points where coal trains have to stop or slow down pilfer coal from the cars, and in many cases such people never purchase a pound of coal and do not pretend to do so just so long as they are permitted to procure sufficient to keep them warm. Pilfering from the cars is a simple matter, as most coal is shipped in open cars.

While in recent years the railroads have issued orders that all coal used by station agents, section gangs, construction outfits, flagmen, and switch tenders be purchased from the mines, it is a common practice for these agencies of the railroads to help themselves to whatever coal they are in need of, and as a rule they select the choicest and most expensive coal from the cars in transit. If by chance they are discovered in the act of taking this coal, they justify themselves by saying that they are unable to determine which is company coal and which is the coal consigned to the dealer.

The question might be asked: Is it not possible for the dealer to keep track of the actual amount of coal in each car and recover the shortage, where a shortage exists, by filing claims and prosecuting the same with the railroads? The answer is that the penalties and red tape imposed on the consignee by the railroads make it more expensive to collect on this class of shortage than to take the loss in the first instance. Not only does the consignee pay for the shortage, but he is compelled to pay the railroads freight charges on that which he does not receive.

If mine owners and railroads are permitted to deliver short weight to the dealers, why not throw down the bars and permit the retailers

to short-change their customers? With a close margin of profit for the retailer, would he not be tempted, knowing that he had been short weighted, to get even by the same method that is imposed on him? The tendency, no doubt, would be along that line.

If railroads were compelled to give destination weight without great trouble or inconvenience to the retailer, there is no doubt that vigilance of weights and measures officials could be considerably relaxed without endangering the public to short weight. As far as Utah is concerned the question might be asked, and very logically, too, as to why the requirements of the destination-weight bill are not enforced. The history of the destination-weight bill in Utah reads like a chapter from an old fashioned "yellow-back" dime novel.

Considerable time, money, and effort have been expended by those interested in destination weight to secure the passage of a suitable bill. Each time the matter was presented to the legislature it was met by the solid phalanx of the railroad lobby in an attempt to frustrate the efforts of the proponents of the bill. Finally, the first bill was unanimously passed by both branches of the legislature and signed by the governor. After the legislature had adjourned the dealers were informed by the attorney general that the bill was invalid, inasmuch as it contained a joker in the shape of an interstate clause. In the following meeting of the legislature a bill was presented eliminating the objectionable clause, which bill was passed, but was subsequently vetoed by the governor on the ground that a destination-weight bill was already on the statute books. A third time the bill was presented to the legislature, and a third time it was passed, and this time signed by the governor, the bill to take effect at a fixed time. This time the railroads were successful in deferring the operation of the bill until the war was thrust upon us and the railroads were taken over by the Government. At this time the dealers were politely informed by the railroads and counsel that owing to Government control the railroads were not subservient to the State. During this time the railroads, fearing that when the roads were returned to private ownership they would be compelled to weigh the coal at destination, removed a number of their scales, thus defeating any attempt to enforce the law.

In conclusion will say that a volume might be written on this subject if one should enumerate specific instances relative to the present methods of railroads in handling coal shipments. I feel that sufficient has been said to open up the subject for discussion, and trust the delegates will feel free to give expression to their ideas on this subject.

DISCUSSION OF ABOVE PAPER.

Mr. Stewart. This is not in relation to destination weights, but, taking the other side, I would like to make a statement. You can go to almost any coal operator or producer and he will tell you that he will lose on the railroad weights from 100 to as high as 500 and 600 tons per month, depending on the amount of coal that he produces. The coal is sold by railroad weights.

Mr. Rowland. In 1917 the city of Kansas City, Kans., ordered 30 cars of coal from the mines in Wyoming because we could not get it from the east. The coal was delivered in box cars and the cars

were sealed at the mine and every one of the cars ran short from 2 to 5 tons. It seemed to me at the time that the shortage occurred at the mine, because, while there is a shrinkage on coal, it could not have been very much when it was inclosed in box cars. We filed a bill for the shortage, but could not get anything on it at all. It never was satisfactorily settled. The dealers in Kansas City are short on every car of coal they receive, and they never can get any settlement out of it, and the mine owners say the same thing as this gentleman over here, that they sell the coal at the railroad weights.

Mr. McAteer. I represent a mining company that ships coal from West Virginia. That coal going east is hauled 106 miles before it is weighed at Keyser. Going west it is weighed at Hillyer, 116 miles away. In the two years and a half that we have been paying the miners by weight our company has never come out even; we have been short every month. We pay the miners by the mine weight and we sell it by the railroad weight. We are trying to find the cause of the discrepancy. They claim that atmospheric conditions have some effect on it, and also that coal is stolen en route. The approximate average shortage is one-half of 1 per cent.

Mr. Wood. It seems to me this situation should be met in some manner. I have in mind the case of a small local dealer. His shortage last year was 682 tons on his year's supply.

Mr. Mote. We have found in Ohio some big discrepancies on the tare weights of cars.

Mr. Stewart. With the exception of the two points mentioned by Mr. McAteer, all of the coal that is dug in West Virginia is taken to some other State and weighed. I am trying to get a law that will compel the railroad companies to put in and maintain railroad scales within a reasonable distance of the mine, where they will be under State supervision.

MINE-SCALE WORK OF THE BUREAU OF STANDARDS.

By Louis A. Fischer, *Chief, Division of Weights and Measures, Bureau of Standards.*[6]

The investigation of mine scales by the Bureau of Standards was inaugurated in August, 1917, in response to a request from the authorities in Maryland, who were confronted with the prospect of an immediate general strike as a result of a dispute as to the correctness of the scales upon which the coal mined by the individual miner was weighed and from the weight thus determined his wages computed. The need for all the coal that could be mined was a matter of national importance at that time, and the local authorities were naturally alarmed at the possibility of a shutdown of the mines, cutting off of the supply of coal from this source. It appeared that the miners had lost all faith in the ability of the State to correct conditions existing, and insisted upon tests by the Federal Government, which they held would be free from local influences and fair to both sides in the controversy. In this emergency the State authorities turned to the Bureau of Standards. While there were no funds avail-

[6] In the absence of Mr. Fischer this paper, prepared by him, was read by F. S. Holbrook.

able for this special purpose, the case was of sufficient importance to warrant the use of our reserve funds, and one of our best men was detailed to the work. A ton of 50-pound test weights was shipped to Cumberland by express, transportation from there to the mines in question was furnished by means of a motor truck provided by the local authorities, and the work was begun only a few days after the original complaint was filed with the bureau.

The result of this particular investigation showed that the miners had just cause for their complaint, since many of the scales were found to have important errors against the workers. However, as soon as the scales were declared by the bureau to be in order and operating correctly the miners forgot their grievances, those who had ceased work returned to the mines, and the incident was closed. Subsequently complaints were received from other sections of the soft-coal regions, and to meet these demands the bureau asked for and received from Congress an appropriation of $15,000 to carry on mine-scale investigations.

Description of mine-scale testing equipment.—As soon as the funds were available the bureau purchased two motor trucks equipped with special features necessary for the sure and rapid transportation of the field party and of the test weights and other apparatus. The trucks were obtained from the War Department and were built on a contract for the Aviation Service. They are of the so-called "light aviation" type, now commonly seen in the Public Roads Service, as Congress has since then authorized the transfer of a large number of these trucks to this service. They are designed and built to obtain a combination of speed, power, and endurance. Special features embodied are a 2-ton Continental motor on a 1-ton G. M. C. chassis, solid disk front and rear wheels, double pneumatic tires on each rear wheel, and special hubs and extra wheels designed to minimize road delays on account of tire trouble. Recently solid tires of the cushion type have been installed on the rear wheels of one truck, but they have not as yet been tried out under service conditions. Bodies were built to afford convenient means of hauling and handling 2,400 pounds of test weights in 50-pound units, sealers kit, other necessary testing apparatus, and baggage of the field party who make the truck their chief means of transportation.

Field party.—The field party of two consists of an inspector or engineer in charge and an assistant who acts as driver, mechanician, assists in the testing work, and performs other duties in his spare time. The inspector selects territory, arranges and directs details of tests, makes adjustments when practicable, and advises regarding weighing conditions and features of installation. He must play a ticklish rôle in a situation fraught with continual discontent. His position is analogous to that of a baseball umpire deprived of the privilege of banishing those who cast more or less profane aspersions upon his efforts to be fair. The slightest hesitation or misstep in a critical situation is likely to bring the work of the whole test to naught as a result of suspicion engendered by an apparently unreasoning attitude of both parties to an age-old and bitter controversy.

Attitude of miners.—In the coal-mining profession it is axiomatic that no coal miner was ever satisfied that the tipple scale gave him credit for as much coal as he dug, loaded on cars, and sent out of the mine. Generally the opinion is that all scales are fixed and all weigh-

FIG. 1.—*Bureau of Standards mine scale testing equipment No. 1*

masters are dishonest. Detailed and voluminous information as to the causes for this attitude can be obtained from any coal miner.

The following incident, which happened to one of our inspectors, illustrates the situations which commonly arise in connection with the weighing of coal. In the autumn of 1918, when one of our equipments was operating in eastern Ohio, the inspector in charge received an urgent call for his services in settling a strike on account of weighing conditions that had kept a mine closed down for the preceding three days. The mine is one of the country's largest, and the closure of it at that particular time was a matter of more than ordinary or local concern. The following recital is in the language of the inspector who handled the case:

> Few of the miners could speak English. They had employed for a checkweighman a Greek, whom all knew as Pete, an obstreperous little runt whose hair line began half an inch from the bridge of his nose. Pete's qualifications for election to his responsible position were a captious temperament, powerful and untiring lungs, and a dramatic manner of expression, all of which he was employing to the fullest extent when the bureau's equipment arrived. After much loss of time our inspector finally got him cooled down to the point of confining his oratory to the English language. It seemed that the superintendent had taken some liberties with him. As a matter of specific fact the superintendent had told Pete to take his crazy ideas and go to —— with them. Instead of doing as he was told he called out his gang. During the council of war the inspector asked for the company weighmaster. The superintendent asked, "Which one do you want? We have a dozen or more around. This —— buzzard [pointing to Pete] runs one out of here every day or so." The strange part of the whole affair was that all of Pete's contentions turned out to be absolutely true. The company had made an agreement to stop and uncouple the cars of coal before weighing them. This they had failed to do, and Pete contended that under the circumstances one of the two scales in use weighed every car 300 or more pounds light. The test showed that all of Pete's claims about the scale were absolutely correct, although how he obtained the information was a mystery, since he had no adequate means of determining the facts.
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> Nevertheless, the United Mine Workers' agreement provided other means of redress, and Pete should not have called a strike. Under the agreement the company was authorized to assess a penalty of $1 per day per miner for each day the mine was closed down, the proceeds to go to the American Red Cross. The company offered to pay all the fines if the miners would call a meeting, declare Pete's job vacant, and elect a successor. A meeting was held, but the miners elected to pay their own fines, and at a late inquiry Pete was still holding down his job with unabated zeal.

On another occasion one inspector was called to handle a strike over weighing conditions at a mine in West Virginia. The miners were Italians. They had decided that both the company weighmaster and their own checkweighman were dishonest, had discharged the checkweighman, closed down the mine, and set about to test the scale to their own satisfaction. They carried a small portable scale from the company store up to the scale, pulled out a car of coal, weighed it on the company scale, and then began weighing it a tubful at a time on the small scale. Things progressed very smoothly until the car was emptied. Two of the men had been chosen to keep tally. After the weighing was completed one of them had checked off 23 tubsful and the other 25. The first thing the inspector had to do on arrival was to assist the superintendent in quieting the rather animated discussion that followed this disagreement and which bade fair to end in a riot. The test by the bureau showed that the suspicion of the miners was justified. Through ignorance or carelessness an oil-filled dashpot commonly used to dampen beam vibrations had

become partially dry and an error of about 300 pounds per car ensued.

Generally, the tests made by the bureau have a very favorable effect. In cases where the scales are found correct distrust and suspicion are allayed, and where they are found incorrect and corrective measures are applied confidence is restored.

Method of test.—The method of test is not widely different from that of testing an ordinary platform or wagon scale. Coal-tipple scales are usually of 3, 5, or 10 ton capacity. A test to capacity by applying test weights is impracticable, as it is impossible to transport and handle more than 1 ton of test weights with efficiency. Loads of one-fourth, one-half, and 1 ton are applied and the errors and multiplications at those loads determined. The actual weight of an empty car is determined by the method of substitution and the weights then loaded into this car. This gives a test load usually in the neighborhood of 2 tons, depending, of course, upon the weight of the car. A car full of coal is then applied and weighed at each end and in the center of the deck to develop sectional errors. Sufficient test weights, usually 500 or 1,000 pounds, are added to determine the multiplication, from which the actual weight of the car of coal is computed and compared with the weight indicated by the normal operation. The car is then dumped and weighed empty. The weight of coal thus obtained is compared with the weight which would normally be credited to the miner on the tipple sheet. The procedure is similar for a hopper scale, excepting, of course, the necessary manipulation to determine the weight of empty cars. By simply passing coal into the hopper a test load can be built up by the method of substitution to any desired value.

Situation of mines.—Most of the mines in the eastern coal fields are in mountainous country and accessible only by roads of the worst possible description which tax the power of the engine and the strength of the loaded truck to negotiate them. Sometimes the efforts of outside assistants are necessary. It is, of course, desirable to get the truck as close as possible to the scale so as to reduce the labor of handling the weights to a minimum. This occasionally results in abandoning the roads entirely and the crossing of railroad tracks and streams are daily occurrences.

One of the greatest obstacles to the proper maintenance of proper weighing facilities is the fact that mines are temporary and everything connected with them is likewise so. "Why should there be expensive permanent foundation provided for scales to be abandoned when the mine can no longer be profitably run?" is a question often asked by the operator.

Types of mines.—The mines encountered are of many different types, among which may be mentioned the following:

DRIFT MINE.

A drift mine is one in which the coal seam or bed is entered laterally. In some localities the coal seam lies high in the hills or mountains and the mine entries are driven in at some point where the coal seam "crops" out in the side of the hill.

SHAFT MINE.

A shaft mine is one in which the coal bed is entered by driving a vertical shaft down to the bed. This is necessary in localities where the coal lies deep under the surface.

FIG. 2.—*Drift-mine tipple, showing loaded cars of coal being hauled to scale; mine scale testing equipment in foreground*

FIG. 3.—*Typical shaft-mine tipple in southeastern Ohio fields; mine scale testing equipment being unloaded at left*

FIG. 4.—*Transportation of test weights by mules and sled several hundred feet up mountain to mine inaccessible to truck*

FIG. 5.—*Another method of moving test weights to drift-mine tipple inaccessible to truck by loading into mine car at accessible point on track*

STRIPPER MINE.

In some localities the coal lies so close to the surface that the earth covering can be "stripped" off by steam shovels and the coal taken up in the same way. Such a mine is called a "stripper" mine.

LOW COAL MINE.

The term "low coal" mine is applied to mines working in a comparatively shallow coal seam, say, 42 inches or less thick.

HIGH COAL MINE.

The term "high coal" mine is applied to those mines in which the coal seam is so thick that a man can walk about under the mine roof without stooping.

TICKLE BACK MINE.

A "tickle back" mine is a small operation whose output is less than 100 tons or so daily.

DOG MINE.

A "dog" mine is a drift mine in which the coal is hauled out of the mine by dogs hitched to small cars running on wooden or iron rails. The coal is so low—i. e., the seam is so shallow—that a mule or pony can not get into the mine. There are a few of these in the vicinity of Zanesville, Ohio. The coal seam is 24 to 28 inches thick. The dogs show a collie strain.

TRUCK OR WAGON MINE.

A truck or wagon mine is one situated away from a railroad, making it necessary to haul the coal away in wagons or motor trucks.

It is necessary that scales be installed in different ways in the case of mines of various types. Also, the nature of the topography of the neighborhood has an important bearing on the installation. The foundation for the scale will of necessity be much below the level of the scale in the case of a shaft mine. The same thing is true if the ground falls off rapidly at the mouth of a drift mine. No two are exactly alike, but doubtless they could be grouped in classes in which the problems would have a sufficient similarity to permit of a common solution. Certainly the installation of a scale having the important function of fixing wages of a large group of men is entitled to our first consideration and thought.

Number of tests.—Up to April 1 of the present year about 450 scales had been tested at different coal tipples in Maryland, West Virginia, Ohio, Kentucky, Tennessee, and Georgia. Of this number about 63 per cent failed to pass a tolerance of 0.40 per cent of the applied load or 4 pounds per thousand, which will be recognized as being twice the tolerance applied to railroad-track scales and other commercial scales. Seven per cent had errors of 50 pounds; 48 per cent had errors in excess, and 52 per cent had errors in deficiency, from which it appears that, on the whole, little or no attempt is made to short weight. Since April 1 our trucks have been working in the State of Indiana.

As a result of the accumulation of information the bureau has drawn up tentative specifications for coal-tipple scales and their installation, but they are not yet ready for publication.

General attitude of bureau.—The purpose of the bureau in this as in all testing work is to improve the accuracy of the scales, their installation, and general weighing condition. It desires to do this for

the benefit of the operator and the miner. False weights, be they intentional or accidental, should not be permitted by the Government any more than it should permit the counterfeiting of money. Any Government that permits either can not claim first rank in this day. False weights should be penalized by laws comparable in their severity to those relating to coinage. Nothing could conceivably give the thousands of ignorant foreigners working in the mines so false an impression of our institutions as to find themselves at the mercy of some dishonest mine superintendent. In their stage of intelligence they make little distinction between the dishonest mine management and the Government. All that they know or feel is that they are being robbed, and that the Government permits it. That is one aspect of the matter. The other is that it is bad policy for the coal industry, just as any other dishonest practice is ultimately injurious for any business.

In the mining industry, where the wages are directly determined by weighing the output of the miners, all doubt as to their correctness should be removed. With this source of misunderstanding and suspicion removed there are still enough sources of misunderstanding left to satisfy the most contentious individual.

Conclusion.—The annual appropriation for this work is $15,000. The number of employees is not definitely fixed, but varies from time to time as the exigencies of the work demand and the amount of the funds warrants. Necessarily the bureau can not meet all the demands made upon it by miners, operators, and weights and measures officials with one or two equipments, which, moreover, can only be kept in the field part of the time on account of the inadequacy of the funds provided for this work. The total number of coal mines is legion and they cover a great amount of territory. Much more could be done if our funds could be increased. The mines are in the States, and their management and troubles might in former times have been regarded as local issues, but this point of view is no longer tenable. The stoppage of mining in one section of the country may have a profound effect upon the business of another section. Like our transportation, the mining of coal is an essential industry, too vital and big to be ignored by the Federal Government, particularly in time of war, when it becomes necessary for the Government to take the railroads and to create machinery in the form of a Fuel Administration to allocate and fix the price of this essential commodity; also the creation of a wage board to consider differences between miners and operators was shown to be necessary. Perhaps in speaking thus I am trespassing upon political grounds—what I assume to be generally admitted may not be so by all. If there be any differences as to the advisability of governmental assumption of authority, the writer has no intention of supporting one or the other by argument. He has merely thought he was stating what was generally admitted to have been necessary under the circumstances.

Assuming, however, that there may be some difference of opinion about these war-time measures of our Federal Government, there could hardly be any difference of opinion as to the advisability and desirability of the Federal Government taking up duties prescribed to it by the Constitution of the United States, which gives it authority to fix the standard of weights and measures. This makes it

the solemn duty of the Government not only to adopt standards but to see that the adopted standards are used in trade. Nothing less than this could constitute fixing the standards. This does not mean that the Federal Government should be the exclusive agency in enforcing the use of the standards. It may and should use and cooperate with whatever agencies are in existence and available, and by cooperation with these bring about the desired result, namely, the use of weights and measures and weighing and measuring devices that shall guarantee the quantity in all transactions, exactly as the medium of exchange is maintained. To bring this about is the problem the Bureau of Standards has set itself, and among the agencies whose cooperation the bureau depends upon in carrying out this program is the Conference on Weights and Measures.

Mr. HOLBROOK. In the course of the investigation a number of pictures were taken of various mines at which tests were made. Mr. H. M. Roeser, one of our inspectors, made most of these pictures, and because he is very familiar with them I am going to ask Mr. Roeser to explain them to you as they are thrown upon the screen.

(Thereupon various pictures were shown upon the screen, accompanied by explanations by Mr. Roeser.)

(Thereupon, at 4 o'clock p. m., the conference adjourned to meet at 10 o'clock a. m. Wednesday, May 25, 1921.)

FIFTH SESSION (MORNING OF WEDNESDAY, MAY 25, 1921).

The conference reassembled at 10 o'clock a. m. at the Bureau of Standards, Dr. S. W. Stratton, chairman, presiding.

TESTING OF LIQUID-MEASURING DEVICES.

By Ralph W. Smith, *Bureau of Standards.*

In the weights and measures official's examination of mechanically operated liquid-measuring devices the general principles to be considered are no different than in the testing of any other type of weighing or measuring equipment, although the liquid-measuring device tests present some distinctive problems. Two prime considerations must be borne in mind. First, the necessity for accuracy on the part of the machine under test, and, second, the possibility of fraudulent use of a machine which might or might not satisfy the first condition when operated in a normal manner.

In the field of mechanically operated liquid-measuring devices by far the greater portion of the instruments are used in the vending or measuring of gasoline or oils. For this reason this discussion will be confined to the types of apparatus used for this purpose, although, in general, the principles enunciated will be applicable to types of liquid-measuring devices designed for other uses. Of that group of devices designed to handle gasoline and oils there are several distinct classes which are usually grouped as piston types, visible types, and meters.

There are certain general principles which apply to all types, but it is obvious that the details of a test differ in some respects for each of the types mentioned. An effort will be made to point out the more important steps in the examination of liquid-measuring devices, with particular stress upon those points which are apt to prove troublesome to the official.

The work of the inspector in relation to any device which he is examining may be divided into two phases, inspection and test. In the case of liquid-measuring devices the inspection is particularly important and necessary in view of the many possible variations in the installation of different machines of the same type and also of the large number of variations between machines of different manufacturers. Normally, inspection should precede test. Invariably on a machine the type of which is new to the inspector a rigid inspection should be made to determine compliance with the specifications affecting the device and to familiarize the inspector with the details and method of operation of the machine. In the case of a device of a type with which the inspector is familiar the detailed inspection is not necessary because he knows whether the particular type in question normally complies with regulations. However, inspection in these cases can not be entirely dispensed with, because the inspector must satisfy himself

that the device is, in fact, similar in all respects to the type he has in mind, and that it has no added attachments or connections which might affect his approval of the installation. These changes from the regular type may consist only of an added pipe or valve and are frequently inconspicuous, but anything unusual should be thoroughly examined and the method of its operation and the reason for its installation determined. In case such unusual attachments or connections are found the inspector must satisfy himself that these are of such a nature that he can safely approve of the entire installation, and that these additions or changes will not interfere with the correct functioning of the device.

It is well to invariably inspect all the indicating or recording elements of any device under examination regardless of whether the type is familiar to the inspector or not. These features of the device are of essential importance to the operator and to the customer, and if their indications are confusing or if they are illegible, accuracy of deliveries is jeopardized.

It is well understood that the operation of a liquid-measuring device depends to a large extent upon the manner in which it is installed. This is particularly true of those types of measuring devices in which supply pipe connections must be tight and in which there must be an absence of air pockets in the line if correct delivery is to be made. In view of this the inspector should, if possible, inspect the entire installation of such devices. It frequently happens that suggestions may be made at the time of installation which will save labor and expense for the owner of the device and time for the inspector by correcting obvious faults, and thus making it unnecessary to subsequently uncover piping and connections when the test is made to remedy defects causing the trouble. In the case of installations which have been completed the inspection should extend as far as practicable and should include such valves, connections, etc., as may readily be examined.

As was suggested above, the actual test of a liquid-measuring device should normally follow the inspection. After a thorough inspection the inspector will fully understand the working of the device under examination, without which knowledge he can not make an intelligent test.

The question occasionally arises as to whether a device should be operated for testing purposes by the inspector or by the owner or user of the device. The claim is sometimes made that the owner or user understands how to operate his device so as to give correct measure, and that if he can so operate it his device should be sealed regardless of whether or not it is in good condition throughout. The fallacy of this contention is at once apparent, because there is no guaranty that the owner will so operate his device at all times, and even though he were perfectly sincere in his intention to operate it so as to give correct deliveries, there is no guaranty that the one man who understands how to give correct measure with the device will operate it at all times. It is also claimed by some operators that they have acquired an unusual facility in operating their device which enables them to make more accurate deliveries than the inspector can make on account of his lesser familiarity with the device. Here, again, there is no guaranty that the highly skilled operator will invariably operate the device in question. It follows, therefore, that a

device which will not function properly when operated in an ordinarily skillful manner by the inspector can not be said to be a proper device for commercial use.

It may also be said that if a liquid-measuring device fails to function correctly when operated in any reasonable manner, even though this may not be the method customarily used by the operator or recommended by the manufacturer, there is grave doubt as to the desirability of permitting the use of the device. It must be borne in mind that a particular machine holds itself forth to do certain things, and if it is not so constructed as to limit the manner in which it can be used to those methods which will result in correct deliveries it is, in effect, an incorrect piece of apparatus. This does not mean that a liquid-measuring device must be absolutely "foolproof" and incapable of being operated in a fraudulent manner—we know of no such device to-day—but it does mean that no method of operation which might well be adopted by a conscientious operator should result in inaccurate deliveries. The general principle can then be laid down that any method of operation which may reasonably be expected to be used by an operator of a liquid-measuring device is a proper method to be used in testing such a device, and failure of the device to meet the demands of such a test should result in nonapproval.

There are a number of factors which enter into the accuracy of the delivery of various types of liquid-measuring devices. One of the most important of these is the speed of operation. Certain types of devices are more seriously affected than others by a change in speed of operation, but almost all types of devices are so affected to at least some degree.

When a body of liquid is in motion it tends to remain in motion until it is checked by some cause or other, such as the force of gravity, meeting an obstruction, or having its speed gradually diminished through friction. In the case of a piston-type liquid-measuring pump the column of liquid is set in motion by the operation of the hand crank or other motive power and liquid moves throughout the entire system. A considerable body of liquid is affected, and at the end of the piston stroke this column of liquid may be moving at a rapid rate of speed. If it were not for gravity, friction, and the action of the valves in the system, this column of liquid would tend to continue its motion, and thus the device would deliver very much more than the nominal discharge. On account of these causes, however, the column of liquid is quickly brought to rest. The period intervening between the conclusion of the stroke and the time when the liquid is at rest is, among other things, dependent upon the speed at which the column was moving and is thus affected by the speed of operation of the device. Fast speeds of operation may thus be expected to result in deliveries in excess of the normal amount.

The very fast stroke, however, is not a customary method of operation of such a device. Furthermore, it is impossible to overcome natural laws, and in devices of this character it frequently happens that at a fast speed of operation more liquid will be delivered than at normal or slow speeds. Since this method of operation results in overmeasure, and since the condition causing this excess can readily be controlled by the operator, it does not appear to be reasonable to withhold approval solely on account of this overmeasure.

Very illuminating results may frequently be obtained on piston-type liquid-measuring pumps by a combination of strokes at different speeds; for instance, a fast stroke followed by a slow stroke, a slow stroke followed by a fast stroke, a normal followed by a fast, a normal followed by a slow, etc. Careful study of the results of such a series of deliveries will frequently reveal conditions which are not apparent on ordinary tests. In connection with the fast stroke on piston-type pumps it will sometimes be found that a fast stroke will deliver more than the nominal delivery for which the pump is set, as explained before. If this fast stroke is now followed by a normal stroke it will be observed that the delivery is less in amount than the customary normal stroke. The cause for this seeming inconsistency is apparently a "throwing over" of a certain amount of liquid at the conclusion of the fast stroke, so that when the liquid column comes to rest the level of the liquid is actually below the top of the standpipe. Obviously, this empty space in the standpipe must be filled on the subsequent stroke before the delivery begins and the delivery will be short an amount equal to the volume of the liquid necessary to bring the height of the liquid up to the level of the top of the standpipe.

On the other hand, if the speed of operation of a piston-type pump is reduced below the normal speed the effect of leaks in valves and packing may be magnified, since the liquid has a longer time during which to seep back around the piston or through leaky valves for a nominal delivery of a certain amount. Inspectors generally appreciate this latter condition and use their knowledge in making certain tests for leakage. If a valve is provided by means of which the discharge line may be closed off and this valve is closed and pressure applied to the system by turning the operating handle, it may quickly be demonstrated whether or not certain defects exist. In case continued moderate pressure on the operating handle results in a forward motion of the handle without the delivery of liquid through the discharge orifice any one or a combination of several conditions may be operative. The piston valve may not seat properly, thereby allowing the piston to rise in the measuring chamber without displacing any liquid. There may be a leakage between the walls of the cylinder and the piston, producing the same result. There may be a leakage of liquid through stuffing boxes or connections so that liquid is actually being displaced from the measuring cylinder without passing through the discharge orifice. A test of this kind is a valuable one and should be made use of in the test of piston-type pumps. Care should be taken, however, not to confuse an actual forward movement of the operating handle with the slight forward and backward movement which may be produced when the liquid is being forced against an air cushion of considerable size, as would be the case if an extremely large expansion chamber were used or if the discharge line had been closed off at some such point that a large amount of air was trapped between the shut-off point and the liquid.

Still considering piston types of pumps, a test somewhat similar to the above may be applied to certain types to reveal the presence of air leaks in the line below the measuring cylinder. If the operating handle is advanced and if there is air present in the line, a check

valve through which air is passing will, to use the customary term, "chatter." If this check valve is located above ground, it can frequently be heard to make this chattering sound when a leak is present, and such a sound is always indicative of air in the line.

In the case of the visible types the speed of operation does not have such a large effect. Where a measuring chamber is filled by some means and allowed to drain down to a certain overflow point which determines the correct setting for the capacity of the cylinder, the speed with which liquid is introduced into the measuring chamber is of little importance, provided that a suitable interval is allowed for the draining off of the excess liquid, and provided also that air is not incorporated into the liquid in such quantities as to cause the level of the liquid to drop below the overflow point after the main overflow has ceased, by reason of bubbles arising through the liquid. In the case of devices of this character without an overflow and in which it is necessary for the operator to make a setting on a line or at a point, the speed at which the liquid is introduced into the chamber has much to do with the accuracy of the setting. Inaccuracy in making the initial setting, of course, affects subsequent delivery.

The speed of delivery has practically no effect upon the accuracy of delivery in the visible types in those cases where the measuring chamber is completely emptied or is drained down to a definite overflow point, provided, of course, that sufficient time is allowed for proper drainage. It is obvious that where the amount delivered must be determined by a setting to a line or point too great a speed near the conclusion of a delivery is very apt to result in an incorrect delivery through failure to accomplish an accurate setting.

In the case of meters the speed of delivery has some effect upon the amount delivered, depending largely upon the type of meter. If the delivery is made too slowly, the meter will underregister, in other words, the delivery will be in excess of the indicated amount, while if liquid is forced through the mechanism too rapidly, leakage may occur with the same result, namely, the passage of unmetered liquid through the device, but the overmeasure in the latter case will be very much less than in the former.

The hose through which gasoline deliveries are customarily made is a source of frequent error. A dry hose 8 or 10 feet long will retain an amount of liquid in excess of the present tolerance (2 cubic inches) on a single gallon. Experiment has shown that a 10-foot length of three-quarter inch hose with the ordinary nozzle and connection requires 3 cubic inches of gasoline to wet it. Hose of larger size would, of course, require a larger amount. For this reason a delivery after standing to determine the error in an elapsed-time test should preferably be made with the hose disconnected in order to eliminate the error due to the wetting of the hose. A delivery hose which is so badly worn as to seriously retard drainage or permit an actual leakage should not be permitted in use, and the liquid-measuring device should not be approved until suitable hose is supplied.

A very important element to be taken into consideration in the test of a device used in the handling of gasoline is temperature. As pointed out in the specifications adopted at the Thirteenth Annual Conference, the change in volume of gasoline is approximately 0.7

per cent for each 10° F. change in temperature, or approximately 1.3 per cent for each 10° C. change. In making a test on a liquid-measuring device to determine possible leakages on standing, the so-called elapsed-time test, it almost invariably happens that during the interval between observations the temperature has changed. For instance, if the first observation is made in the evening, to be followed by a second observation the next morning, it is almost certain that during the night the air temperature will drop, and at the time of the morning test the temperature of the gasoline in the system may be lower than it was the previous afternoon. If the difference in temperature of the gasoline is 10° F., there will be a shrinkage of a little more than 1.6 cubic inches per gallon; if 10° C., the shrinkage will amount to 3 cubic inches per gallon. These shrinkages will frequently result in corresponding shortages to the customer. If the difference in temperature is greater or less than 10°, then the shrinkage will be correspondingly greater or less. If the initial test is made at a time of day when the temperature is relatively low and a period intervenes during which the temperature rises, expansion will take place, which may result in the passage of a certain amount of gasoline over the top of the standpipe and into the delivery hose or through some other outlet, this, of course, assuming that the system is full of liquid to begin with; or the device may indicate that the measuring chamber is overfull. Under these conditions if the temperature subsequently drops there may be a shortage on the first delivery in the same ratio to the temperature change, as has been explained before, in all cases where the excess resulting from the expansion has been allowed to escape. It should also be borne in mind that it is only the gasoline above ground which is affected by a change in air temperature. The quantity of this liquid varies, depending upon the construction of the particular device in question.

In the case of all of those liquid-measuring devices which depend upon the setting of a liquid level to a graduation line or point for the accuracy of their delivery the meniscus of the liquid must be given very careful consideration, since this meniscus is, in effect, the indicator of the device. The meniscus of gasoline is very pronounced and of appreciable height. The apparent height of the meniscus varies somewhat according to the diameter of the tube or other chamber in which the liquid stands. In the case of menisci in glass tubes experiment has shown that there is a difference of as much as 0.03 inch in the apparent height of the meniscus of low-test gasoline in tubes of one-fourth inch and seven-eighths inch internal diameter, the height in the one-fourth-inch tube being approximately 0.07 inch and in the seven-eighths-inch tube approximately 0.10 inch. Moreover, the clearness with which the meniscus may be seen is dependent largely upon the amount of light thrown upon the tube and the direction from which it comes. It is well known that a black band placed around the back of a tube slightly below the bottom of the meniscus has the effect of sharply defining the lower edge, so that a much more accurate setting can be made. This expedient is resorted to in laboratory determinations with very good results, and it is unfortunate that the same thing can not be done in the case of gauge-glass types of liquid-measuring devices. The necessity for moving the band to agree with the position of the meniscus, however, makes it difficult to use this method of defining the meniscus.

The general laboratory custom in the reading of menisci is to consider the extreme bottom as the reading point. This is ordinarily the most satisfactory and most sharply defined reading point, and its universal use in making the settings in the case of liquid-measuring devices would be recommended if this method were practicable. However, when the meniscus is at a considerable height above the operator's eyes, or when the operator is at some distance from the gauge glass, the extreme bottom of the meniscus can not readily be seen. This makes it necessary to select some other reference point in the meniscus which may be used at all times, for it is at once apparent that if readings are sometimes made to one point and sometimes to another variations in deliveries will be unavoidable. Now, if the surface of a column of gasoline is viewed through a gauge glass it will be observed that somewhere near the center of the meniscus—that is, at a point about midway between the extreme top and the extreme bottom of the meniscus—a dark band can be seen. Since this dark band is practically the only portion of the meniscus that is well defined under all conditions encountered in gauge-glass liquid-measuring devices as at present constructed and installed, it is probably the only feasible indicator to be used. Settings of this dark band in coincidence with graduation lines can be made with a fair degree of accuracy if certain precautions are observed, as discussed hereafter.

Experience has demonstrated that parallax is one of the most disturbing elements entering into the reading of the indicating means on liquid-measuring devices. The ordinary effects of parallax are familiar to all—the apparent change in position of the indicating elements when viewed from different positions. However, there is one manifestation of parallax in relation to the liquid surface in gauge glasses as ordinarily installed on liquid-measuring devices which is probably not so well recognized and is therefore worthy of a brief description. If the top of the liquid column is above the height of the observer's eyes and is viewed from a point directly in front of the gauge glass, one apparently accurate setting of the dark band on the graduation line may be made. Without changing the height of the liquid column or of the operator's eyes, if the operator moves to one side or the other and views the meniscus from an angle, the dark band appears to have fallen and the previous setting appears to have been in error. The apparent displacement of the dark band differs with the height of the liquid surface above the observer's eyes. It amounts to approximately 0.05 to 0.12 inch in vertical height on a tube of approximately three-fourths inch outside diameter at different heights and between extreme positions; that is, when viewed from the front and from well around toward one side. When viewed from intermediate points between these two, the dark band appears to assume intermediate positions with reference to the graduated scale, so that a large variety of apparently correct readings for the same setting of the meniscus may be obtained by the operator varying his position.

Experiments which have not as yet been completed indicate that this apparent displacement of the dark band may be minimized, if not entirely eliminated, by providing a proper background for the gauge glass. The ordinary custom has been for the gauge glass to be sunken in the backing to a depth equal to about one-half of

the diameter of the gauge glass. If the groove in the backing is made deep enough for the gauge glass to be recessed to a depth of about three-fourths of its diameter, the displacement referred to seems to disappear almost entirely. Further investigation is expected to provide a satisfactory solution of this problem.

That the condition just described is a serious one is readily apparent when we consider that in the operation of devices using a gauge glass as the indicating means the position of the operator is never definitely established at one certain point—that is, he is not required by the construction of the liquid-measuring device to view the meniscus always from the same position—and if this condition is not overcome in some manner errors will invariably occur unless the operator uniformly stands in the same position in relation to the gauge glass. Failure to do this would produce a dangerous lack of constancy in deliveries for the same nominal amounts and the inaccuracies might be entirely inadvertent on the part of the operator. Furthermore, the angle of vision of the customer is almost always different from that of the operator, and, therefore, under present construction, they will not check each other's readings.

It should be unnecessary to detail each step in the test of the various types of liquid-measuring devices. The inspector should satisfy himself that the machine under examination will make deliveries within the allowable tolerance on all amounts which it holds itself forth to deliver—that is, the test should include not only the nominal capacity of the device, but also all of the intermediate stops and as many of the scale subdivisions as is practicable. Also, in the case of a device designed to deliver a very large number of amounts depending upon predetermined prices per unit of volume, it is impracticable to test every such amount. A sufficient number, however, should be tested to insure the inspector that the device is properly constructed, and a careful examination should be made of all the indicating elements to assure him that they are uniformly and properly placed.

In the test of a meter it has been mentioned that the speed at which the meter is operated may affect the accuracy of delivery. One factor controlling the speed of operation is the pressure at which the liquid is forced through the device. Where a meter is installed, the inspector should satisfy himself that the meter will function properly at any pressure at which the liquid may be supplied to the meter. If he is assured that only one pressure can be used, then, of course, it is only necessary to test at this pressure.

It should be remembered that a single discharge at a particular nominal delivery does not afford sufficient information upon which to base an opinion as to the performance of the device at that point. At least three deliveries for each nominal amount under each condition of test should be made. Wherever more than one outlet for the delivery is provided, tests should be made through each such outlet to make certain that correct deliveries are made, regardless of which outlet is used. A delivery should be made through each outlet following a delivery through the other outlet to determine whether delivery through one affects delivery through the other.

In the test of liquid-measuring devices the standards used by the inspector should be given careful consideration. Field standards so constructed as to enable the inspector to read the errors on delivery directly are, in the writer's opinion, very much to be preferred to

capacity measures which necessitate the use of graduates or supplementary measures to determine the errors on delivery. Such field standards obviate the necessity for these additional measures and reduce errors such as those occasioned by spillage and evaporation. While it is conceded that the type of measure employing a slicker plate is fundamentally capable of more accurate determinations than the field standard mentioned above, nevertheless it is believed that under field conditions results will often be more satisfactory when the latter standard is employed for testing liquid-measuring devices. In case it is necessary to use graduates or small measures to determine the errors on delivery, great care should be exercised to avoid loss by spillage or evaporation and to make the necessary readings as accurately as possible, so that the resulting error of determination may be reduced to a minimum.

Field standards should be of rugged construction, so that they will maintain their accuracy. It goes without saying that such standards should be closely adjusted, so that there may be the smallest possible initial error in the standards used. These standards should frequently be compared with the office standards to assure the inspector of their continued accuracy.

It should be remembered that it takes an appreciable amount of liquid to wet the sides of a measure. A determination made with a measure which is dry will differ from one made with a measure which is wet. Since by far the greater number of determinations must be made with wet measures, it is advisable to use wet measures in all determinations, and it is preferable that the measures be calibrated upon the wet basis or proper corrections applied. Whenever work is commenced, the measures in use should be properly wetted, so as to insure that the first determination will be uniform with all the others. The drainage of the measure is another important factor. A uniform period for drainage should always be observed when the measure is emptied. A 10-second period is suggested as being long enough to satisfactorily drain a measure and as not being so long as to interfere with rapid work.

In this discussion the suggestions made refer to field tests of installed equipment, and methods which might be used in laboratory tests of liquid-measuring devices have not been considered. In this connection it is sufficient to say that the laboratory test involves a relatively large amount of observations of all kinds as compared with the field test. A very detailed inspection is made, and a device is frequently dismantled to permit of a closer examination of certain parts. It is obvious that laboratory methods are neither practicable nor desirable for field practice and need only be resorted to when exhaustive tests are demanded.

REPORT OF COMMITTEE ON WEIGHT STANDARDIZATION OF BREAD, PRESENTED BY A. W. SCHWARTZ, CHAIRMAN.[7]

The committee on weight standardization of bread would report that several meetings were held and the laws of the various States relating to the sale of bread were considered, as well as suggestions offered by the representatives of the baking industry at a joint

[7] The text of the model bread law as adopted by the conference will be found in Appendix II, p. 131.

meeting held yesterday afternoon, at which the subject was thoroughly discussed. After serious consideration the committee has prepared and respectfully submits to the Fourteenth Annual Conference on Weights and Measures the following proposed weight standardization bill. This is simply a draft. The title and the usual verbiage that accompanies the bill in various States is omitted:

SECTION 1. That the standard loaf of bread shall weigh one pound, avoirdupois weight. All loaves of bread manufactured, procured, or kept for the purpose of sale, offered or exposed for sale, or sold, in the form of loaves, shall be of this standard weight or of one of the following weights, and no other, namely, one-half of such standard weight, one and one-half times such standard weight, or multiples of such standard weight: *Provided, however*, That the provisions of this act shall not apply to biscuits, buns, crackers, rolls, or fancy bread, or to what is commonly known as "stale bread" and sold as such, provided the seller shall at the time of sale expressly state to the buyer that the bread so sold is "stale" bread. When twin or multiple loaves are baked, the weights specified in this act shall apply to each unit of the twin or multiple loaf.

SEC. 2. That the * * * shall enforce the provisions of this act. Rules and regulations for the enforcement of the provisions of this act not inconsistent therewith shall be made by the * * *, and such rules and regulations shall include reasonable variations and tolerances, in excess and deficiency, which may be allowed.

SEC. 3. That it shall be unlawful for any person to manufacture, procure, or keep for the purpose of sale, offer or expose for sale, or sell, bread in the form of loaves, which is not of one of the weights specified in section 1. within such variations and tolerances as may be fixed by the * * *. Any person who, by himself or by his servant or agent, or as the servant or agent of another, shall violate any of the provisions of this act shall be guilty of a misdemeanor and shall be punished by a fine of not less than $25 nor more than $200 upon a first conviction in any court of competent jurisdiction, and upon a second or subsequent conviction in any court of competent jurisdiction, he shall be punished by a fine of not less than $50 nor more than $500, or by imprisonment in the * * * jail for not more than six months, or by both such fine and imprisonment, in the discretion of the court.

SEC. 4. The word "person" as used in this act shall be construed to import both the plural and the singular, as the case demands, and shall include corporations, companies, societies, and associations.

Respectfully submitted.

(Signed) A. W. SCHWARTZ,
G. G. FRARY,
L. S. SCHOENTHAL,
W. T. WHITE,
Committee on Weight Standardization of Bread.

DISCUSSION OF REPORT OF COMMITTEE ON WEIGHT STANDARDIZATION OF BREAD.[8]

The CHAIRMAN. We will consider this proposal section by section.

Mr. CUMMINGS. I note in the reading of the report that fancy bread is exempted from the provisions of the law. I think that unless there is a statutory definition of "fancy bread" as mentioned in the act it will be the source of a whole lot of trouble in prosecutions.

Mr. HOLWELL. In New York City for some years the large bakeries have refused to take back stale loaves, so the grocers who handle this commodity sell some stale bread. I think that including that term "stale bread" is leaving a loophole.

Mr. ESTES. Stale bread can be exactly defined.

[8] The text of the model bread law as adopted by the conference will be found in Appendix II, p. 131.

The CHAIRMAN. I want to say that in all these discussions we will be glad to hear from the representatives of the bakers. We want to get both sides of this question.

Mr. CLUETT. In the case of the Chicago ordinance, we found it was a very good proviso to leave it to the seller himself. If he declares at the time of sale, "This is stale bread," that, of course, lets him out of the provisions. If he does not declare it stale bread, then it is considered fresh bread.

Mr. STUHR. Mr. Estes has the idea on that. If the law provides that the bread must maintain the specified weight within the tolerances for a specific period of 24 hours, that determines the length of the period that your bread will be considered as fresh bread. After that period if it loses too much weight, or if the seller sees fit, he would call it stale bread. The period of maintaining the standard weight is very important and should probably be a period of from 12 to 36 hours. In Nebraska it is 24 hours.

The CHAIRMAN. There is no motion before the house in regard to this particular point, and if none is made I will ask you to approve this section as a whole.

Mr. STEINEL. I would like to move that it be amended to read, "shall be of the standard weight of one pound, one-half pound, one and one-half pounds, or multiples of one pound."

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. MOTE. I move that section 1 be adopted as amended.

(The motion was seconded.)

Mr. RABENOLD. I think that the conference ought to know a little bit more of what happened in the committee meeting yesterday afternoon, because what happened was a sequel to what was said in the forenoon. I do not have any idea of influencing the vote at all. I know this section is going through.

After full discussion of the views that were expressed on the part of the baking industry, at the request of the committee, I wrote out a suggested section that, in the opinion of the representatives of the baking industry here, might meet with the approval of the entire baking industry of the United States. That section provided, first, that bread shall be sold by weight; second, that a representation of the weight of each loaf of bread shall be made in connection with each such loaf of bread; third, that this representation of weight in the case of wrapped bread shall be made upon the wrapper of the loaf. In the case of unwrapped bread such representation of weight shall be made upon a label attached to the loaf. With respect to the representation on the wrapper, or in respect to the representation made upon the label, such representation shall be in terms of ounces, with the name of the manufacturer in plain bold-faced Gothic type, not less than 12-point, with the exception that in the case of unwrapped bread sold at retail upon the same premises where manufactured, representation of the weight of that bread may be made upon a notice conspicuously posted in those premises where manufactured and sold.

The baking industry, not officially but unofficially, proffered that to your committee as a nucleus of a uniform bill. I am calling your attention to that here, so that there may be no misconception about this matter of weight of bread. There is no opposition—in fact, there

is full accord on the part of the baking industry—that bread shall be sold by weight, and that there shall be a representation of weight with respect to every loaf of bread that is sold in the United States.

Where your committee seems to differ from the representatives of the baking industry is that your committee, for reasons that have not at all been made plain, insists that the representation of weight must be made in only one way, namely, by a fixed standard loaf of bread. I submit to you that that is none of your business. That is an unwarranted interference with the baking industry, and upon that issue we will have to contest in due time this recommendation if it is sought to put it into effect.

We consider that the public interest is fully subsrvd by what we have voluntarily proffered to the officials. It is beyond the province of weights and measures officials to seek to regulate an industry merely because, forsooth, it may be easier for you to enforce the law. We consider that is beyond your province. And, with respect to the recommendation here, there is a practical situation involved that we had hoped might appeal to the committee.

The chairman of the committee represents the State of New Jersey, where there is no law at all. Another member of the committee represents the State of New York, where there is no law at all. The baking industry has been trying to have a law there that bread shall be sold by weight. And yet the officials, in insisting upon a particular kind of law—a standard-loaf law—have so far been unable to get any law at all. As a practical matter, which is the better approach to a controverted question like this? The baking industry feels that trying to fix a particular method of doing the thing that we and you are in accord on accomplishing is an unwarranted interference with the processes of business. Those are considerations that may appeal to some of you, first, as considerations of economics, and, second, as considerations of practicality in this question.

Mr. Steinel. I do not think we ought to allow the bakers to come here and try to tell us what kind of law to put up. They are known as opposing bread ordinances all over the country. They fought them in our State. Their greatest hobby is, when we offer a labeling of bread ordinance, to get up and defeat it by telling legislative bodies how much it will cost to label bread, how many thousands of labels they have on hand that they will have to throw away, how many different kinds of wrappers they must have, and that helps to defeat the bread ordinance. I think we ought to try and adopt a model law here. We have had enough experience to be able to enforce our bread legislation in our various States and cities, to go ahead with the law without listening to this argument. This is the first man who has stated the bakers are in favor of a bread ordinance. Yesterday it was declared that most of them were neutral on the subject.

The Chairman. We are not going to get anywhere by that sort of argument. I dislike the latter part of the baking representative's statement that you should not do this and you should not do that. So I dislike a part of your statement. There is a right side to this; there is a compromise. We will never get anywhere by each side telling the other side what they won't do and what they will do. It is all wrong to say you can not regulate these things, because it is done. In flour, cement, and many other cases, whether it is just or not, it is done, and it is just as reasonable for you to say that the loaf

shall be a pound, a pound and a half, or any other weight you want as it is to say that a barrel of flour shall be so much or that a barrel of apples shall be so much. Those things are all regulated. It is done, and it can be done. Whether it is the right thing is another question.

Mr. McGrady. In answer to the points made by the representative of the bakers, in reference to putting through a law with pounds and ounces on the label, I will state that when I first took office in Pennsylvania 90 per cent of the baking industry of Pennsylvania were favoring a proposed law which was practically a copy of the proposal made here, except that the pound loaf was omitted. I went to Philadelphia and found the representatives of the Philadelphia bakers were absolutely against the law. So the bakers are divided in sentiment in Pennsylvania as to whether they want a pound or not.

Mr. Holwell. The able representative of the baking industry has come here and said that this committee, which has submitted this model bread law, has not the weight standard in the State of New York or in the State of New Jersey.

We in New York had the weight on our bread until this able representative of the baking industry challenged the validity of the law or of the regulations promulgated by the State superintendent of weights and measures. And the reason why every one of the delegates representing the State of New York is in favor of a standard loaf of bread is because we were defeated in trying to sell bread by weight in the State of New York.

The same representative came into my office, representing the large baking interests, where they were charged with civil violations because of improperly marking their bread, and their plea was that through carelessness or negligence on the part of one of their employees a 16-ounce label was affixed instead of a 14-ounce label, and you are going to have a recurrence of the same situation when you go back to marking the bread by weight. Let us have the standard loaf. I want to compliment the committee on bringing in the splendid report which they did. I am for it to the fullest extent.

Mr. Mote. I think that most of us are willing to admit that the regulations promulgated by the Government during the war period, when the loaf of bread was standardized by weight, proved to be a good thing. In Ohio we have a number of cities that have ordinances pertaining to the sale of bread. Some of them regulate and standardize the loaf of bread, but one of our largest cities merely requires a label as to the weight. From the experience we have had for a number of years the mere statement of weight by label on the bread has not proved satisfactory. In other cities, where the loaf of bread has been standardized, it has proven far more satisfactory than the mere statement of weight.

Mr. Rabenold. The baking industry realizes that if there is a bread-loaf statute there is a very practical difficulty there which all the weights and measures officials are familiar with, namely, that there will be mistakes made, mistakes that superintendents of the most expert character in the bakeshop will hardly eliminate, namely, that throughout a period of fluctuating weights there will be a number of different sizes; that is, different labels as to representation of weights, and the employees will make mistakes. But the baking

industry, confronted with that danger, which has been a real danger, is also balancing, on the other hand, the disadvantage of the standard loaf. Some say it is two evils to be chosen between—I mean from the point of view of this practical difficulty that I am speaking of.

What we are seeking to-day in this conference is, however, that, as between the two methods of accomplishing this object this conference wants to accomplish, we choose the bread label, the representation of weight as the lesser of the two disadvantageous situations, because we consider after all that does allow flexibility in merchandizing, flexibility in meeting the public taste, and gives them all the information they can possibly want, as against the rigidity which may be worked out arbitrarily on the standard-loaf measure.

The CHAIRMAN. I want to call the attention of the delegates to one point here which you might overlook. From the speaker's statement just now I assume it to be an admission of fact that they can make a loaf of bread to any predetermined weight. Is that right?

Mr. RABENOLD. I think that goes without saying.

The CHAIRMAN. Then, what is the use of your having a flexible weight?

Mr. RABENOLD. The basic, economic argument is that our currency does not have——

The CHAIRMAN. Ah, you need not go any further. I wanted to bring that out. I admit that—and I think these people see that—the only object you have in favoring the other system is to adjust the prices to suit the changing prices of the ingredients.

Mr. RABENOLD. It is not so much price; it is values. With fluctuating weight it is possible to maintain the same selling price with a different value based upon fluctuating costs.

The CHAIRMAN. That is it precisely. You need not go any further. That is precisely what I meant. I was unfortunate, perhaps, in using the word "price."

Mr. STEWART. The gentleman has admitted that in the marked wrapper the workman makes a mistake, and they come before us and claim that. That is the very thing we are trying to relieve them from. The divider will divide the dough so there is scarcely any variation in the loaf. If we have the standard loaf, the divider will cut off the 16 ounces, the 24 ounces, or whatever it may be, and we will not ask him to mark that loaf, so far as I am concerned, and I think that is the sense of us all. But we want a standard loaf, we want to know what the loaf shall weigh. That will save the workmen making mistakes.

Mr. DAVIS. Mr. Chairman, I want to say that in our State this section, which the gentleman representing the Bakers' Association presents, would not help us a mite. We have wrapped bread, and the attorney general of our State has ruled that, within the meaning of the law, this was a package and, according to our net-weight law, must be marked with the net weight thereon. But we are having all kinds of trouble, such as the gentleman from New York City and others have had, with wrapped bread with the weight marked on it incorrectly.

The CHAIRMAN. There is one point that you have not covered. The representative of the bakers brought out the need for a smaller coin. Would the coinage of a smaller coin help in the matter at all?

Mr. MILLER. It seems to me, Mr. Chairman, that there is one point that has been overlooked. Since I am a food and drug official, as well as a weights and measures official, I see the matter from two different standpoints. In our State at least 90 per cent of the bread is wrapped. If we have a declared weight instead of standard weight, it will be necessary, on account of the fluctuation of price in material and fluctuations of size of the loaf, to have those wrappers reprinted every time there is a change in weight in order that the declared weight may be right. Will that not operate in this way: To drive wrapped bread from the market, so that we will then have unwrapped bread, which is the very thing that the State board of health says we should not have? It is certainly impracticable for the bakers, especially the smaller bakers, to have their wrappers reprinted every few months, or even weeks, sometimes.

Mr. RABENOLD. I can answer that, Mr. Chairman. We have anticipated that there would be more and more legislation of one kind or another, and Dr. Barnard himself, in the American Institute of Baking, has been conducting experiments in inks and colors in order to reach a result which would permit the printing of the weight on the wrapper as the loaf goes through the wrapping machines and is incased in the wrapper; and we are hopeful to-day that we have solved the question of ink so that we can have adequate drier in it to prevent smudging and yet have such incisiveness in it that it will take hold and imprint the weight upon the wrapper, which is usually coated with paraffin. That, at least, is the modern way, not having different kinds of wrappers with various weights printed on them, but having the same wrapper with a printing adjustment on the wrapping machines that would print the weight on the wrapper of every loaf that is being wrapped.

Mr. MILLER. Mr. Chairman, a very large number of bakers in our State have no labeling stamp, and when they adopt a hand stamp they find that it does not stamp half the time.

The CHAIRMAN. If, however, the question of ink is worked out it will work as well with the hand stamp. If there are no further remarks, we will vote on the adoption of section 1.

(The question was taken and the motion was agreed to.)

The CHAIRMAN. I want both the sealers and the representatives of the bakers to understand that while we must take some action in regard to this—we must do the best we can—it does not at all mean that we are not going to improve things as time goes on. We are still open to arguments on this question, and I do not think we will ever take a stand in this conference that will prevent progress. And I hope you gentlemen will still continue to cooperate with us, and I am sure that if it is your desire the bureau will undertake such investigations during the summer as will be needed to settle some of these questions of tolerance, and so forth. Perhaps that can be done in connection with some of your more experienced sealers, and also in conjunction with the representatives of the baking industry. It is all wrong for you to stand on opposite sides. You must get together because, as I have always contended, there is a right side that will be fair to the people and fair to the manufacturers.

(At this point the Hon. Herbert Hoover, Secretary of Commerce, entered the room amid great applause.)

The CHAIRMAN. Our Secretary needs no introduction.

ADDRESS BY HON. HERBERT HOOVER, SECRETARY OF COMMERCE.

Gentlemen, I am glad to take part in welcoming you here. In this I wish also to emphasize the desire of the Department of Commerce that we should cooperate even in a larger degree than hitherto, not only with the officials of the country who are engaged in the important work of this character, but also with the associations of our business men. I am particularly glad to have an opportunity to discuss with you some aspects of standardization. This is indeed a matter to which I have given much thought for many years. It is an outstanding necessity in the mind of every engineer desirous of the advance of industry and commerce. The whole conception of standardization has changed in recent years and has come to the first rank of importance.

There was a time when standards meant the enforcing of public honesty in weights and measures. This great bureau and your public offices had their foundation in that conception. But to-day the question of standards has become a question embracing the very fundamentals of efficiency in our whole commercial and industrial fabric. While we have industrial efficiency developed, in its individual sense, to probably the highest average efficiency in the world, we greatly lack in what one might call our collective efficiency. There is no field where more constructive work can be accomplished in this direction of national efficiency of the whole gamut of production and distribution than in the field of standards.

Dr. Stratton tells me you have been discussing the question of bread weights. That is not entirely a problem of enforcing honesty and protecting the consumer with respect to a return for the money he gives. It is also a question of simplifying the process of manufacture, and in simplifying the process of manufacture you are contributing to a lower production cost and protecting both producer and consumer. We are saving something out of national energies. Fractions of pennies saved to every household and in every industry accumulate to make the wealth and strength of the American people. For this next generation we must meet competition from Europe—competition in a lower standard of living as applied to production—such as we have never hitherto thought possible. We can meet that competition if we can increase the efficiency of our industrial machinery. We can meet it without lowering the standard of American living, because our people have a greater power of initiative; they have more genius for production and for distribution; they have the power of greater exertion, and we can produce our goods on a basis that will enable us to meet any competitor and still maintain the standard of our living. We can only hope to do this, however, if we reduce the losses in our industries and in our distribution, and I know of no factor of that problem that is of more importance than standardization. You are more familiar than I, perhaps, with its many ramifications. It does not extend into the field of destroying style or quality or initiative or individualism. It does extend at once into the whole field of greater uniformity in dimensions. The tremendous waste that we have by the multiplicity of dimensions in standard articles would give us a great credit of national economy if we could find a greater degree of simplification.

I know of no better instance of that than the arrangement set up by the automobile-tire manufacturers by which they reduced the number of dimensions in pneumatic tires to 10 from 216. It is true they still have to manufacture a multiplicity of tires because of the older standards that are current, but when the whole of the demand has been brought to 10 dimensions the cost of manufacture will have been materially reduced and the number of tires that must be carried in stock throughout the year will have been enormously reduced; nor will there have been any interference in style or quality, but there will have resulted an enormous national saving. There is scarcely an industry, there is scarcely a commercial practice, in which some simplification in the underlying specifications and dimensions will not produce national economy. By your positions you have a great opportunity to study and promote these things, and we earnestly desire your cooperation. We can, if we all cooperate together, establish standards that are so manifestly necessary that their adoption will be guaranteed even without legal expression, by the force of public opinion and the convenience of public use.

You are brought into contact with the retail distribution of the country. The economies to the retailer in the simplification of dimensions and the standardization along many lines are such that the retailer, when he once understands the processes, will insist upon specifying that character of production. I therefore feel that you occupy an extraordinarily useful field for public service. Distributed as you are over the entire Union, occupying positions of public importance, you can give study to these problems; you can create the community sentiment for their solution. Nor are these problems interstate problems in many cases. Often enough they are problems within the State and within the city, as is the instance of the bread problem which you have discussed. In other words, in a great program of national economy of this character, you occupy a strategic position, and therefore I want, and Dr. Stratton wants, to cooperate with you in this new sense of standards, where we lift standardization from the plane of protection of honesty in public dealing to a great level of national economy, to the purpose that must be the end of all State and of all governmental action—that we should improve the standard of living of all the people.

I thank you, gentlemen.

The CHAIRMAN. I am sure the Secretary does not know how his remarks have fitted into this discussion at this time. We had just reached an apparent breach—not a real breach, but an apparent one—between the manufacturers and these people who are interested in the consumer, and so many of your remarks have fitted the occasion so well that I am extremely glad you came at this particular moment.

DISCUSSION OF REPORT OF COMMITTEE ON WEIGHT STANDARDIZATION OF BREAD—Continued.[9]

The CHAIRMAN. We have now reached the second section.

Mr. SCHWARTZ. The second section is as follows:

SEC. 2. That the * * * shall enforce the provisions of this act. Rules and regulations for the enforcement of the provisions of this act not incon-

[9] The text of the model bread law as adopted by the conference will be found in Appendix II, p. 131.

sistent therewith shall be made by the * * *, and such rules and regulations shall include reasonable variations and tolerances, in excess and deficiency, which may be allowed.

Mr. HOLWELL. I move the adoption of the section.

(The motion was seconded.)

Mr. BARNARD. May I inquire of the committee whether or not it is their thought that the commissioners or the enforcing authority would have authority under this second section of the bill to set up time limits within which the bread shall be weighed? That is a provision which is already in many of the laws, and it seems to me to be an essential in the drafting of a model law. If the enforcing agent has authority to say that the bread shall be weighed 12 hours after removal from the oven, very well. But if this provision does not take care of that particular matter it seems to me that it ought to be taken care of somewhere in the bill.

Mr. SCHWARTZ. I might reply to Mr. Barnard that that was taken under consideration, and we thought that that regulation should be left to the enforcing officer; that he should make rules and regulations as to when it was to be weighed; that those were regulations that each State could draft for itself; that conditions might differ; and that that should be a matter directly in the hands of the various State departments.

(The question was taken, and the motion was agreed to.)

(Thereupon, at 12.30 o'clock p. m., the conference took a recess until 2 o'clock p. m.)

67370—22——6

SIXTH SESSION (AFTERNOON OF WEDNESDAY, MAY 25, 1921).

The conference reassembled at 2.20 o'clock p. m., Dr. S. W. Stratton, chairman, presiding.

ADDRESS AND RESOLUTION IN MEMORY OF THE LATE JAMES SWEENEY.

Mr. McGrady. In rising to pay tribute to James Sweeney, a man under whom I served, relying so largely on his judgment and friendship, I find it a moment of deep feeling on my part. James Sweeney was essentially self-made, as are those who most impress themselves upon us. He was born to neither wealth nor station. He came from a modest home in Tioga County, Pa., a home pervaded by a generous, wholesome, religious, and patriotic spirit—a frugal home, where love of God, love of neighbor, and love of country were inculcated, where self-reliance was taught.

It is no part of my purpose to recount with anything of detail the life of our departed friend. Most of us assembled here knew him as chief of the bureau of standards of Pennsylvania, who represented the Keystone State for many years at these conferences, and as a man who had carved out his own future—one who had succeeded in life by dint of his own exertions, responsible to no man for his actions, and with a self-confidence that rose superior to all fear and overcame all difficulties, and yet a self-confidence that was as far removed from egoism as is day from night. Quiet and sparing in speech and mild in manner, he had that determination that conquers all obstacles. A man of strong convictions, he had the courage to advocate them at all times and under all circumstances. A man of firm friendships, no one ever accused him of betraying a friend. With an intimate knowledge of his character, I will say that the one secret of his success was his unfaltering devotion to his friends and his unswerving convictions as to his duty on all public questions.

James Sweeney as a man was one of the most faithful men I have ever met. His friendship and confidence once gained, it required the strongest evidence of cause for distrust, and even of guilt, to lose. Mr. Sweeney loved his home, his family, his friends, and Nature. No man really knew him who did not know him in these things he valued most. The great State he represented at many of those conferences gave him unfaltering support as chief of the bureau of standards; no ordinary man could have commanded this.

In Chief Sweeney I lost a personal friend whom I loved, and I shall always feel that my acquaintance with him will be one of the dearest memories I can cherish. It is ever so; the air is full of farewells to the dying and mourning for the dead. The soul of Chief Sweeney has changed its residence, it lingers in the last realm of the eternal, where we, who honor him to-day, must shortly wend our way.

Therefore, Mr. Chairman, I offer the following resolutions, which I desire to have read at the desk.

The CHAIRMAN (reading):

Resolved, That as a further mark of respect to the deceased this conference do now stand in silence for one minute: And be it further

Resolved, That the secretary of this conference be instructed to forward a copy of these preambles and resolutions to his family at No. 1 South Eighteenth Street, Harrisburg, Pa.

You have heard the resolution.

(It was moved and seconded that the resolution be adopted; the question was taken, and the motion was agreed to.)

The CHAIRMAN. In accordance with this resolution I will ask the members to stand.

(The delegates arose and remained standing for one minute.)

The CHAIRMAN. Be seated. I am sure that we regret more than we can say the absence of Mr. Sweeney. I remember the first meeting he attended and his attitude toward a great many of the things we were discussing. I was greatly pleased to see that as time went on he developed a very real interest in the whole subject. Many of the things that he did not see in the beginning were afterwards the very things that he took the greatest interest in, and the conference always benefited very greatly by his advice, and especially his enthusiasm in his subject. He was in continual communication with the bureau, and we had perhaps as good cooperation with his office as any State office.

DISCUSSION OF REPORT OF COMMITTEE ON WEIGHT STANDARDIZATION OF BREAD—Continued.[10]

The CHAIRMAN. We will take up now the regular order of business. We were working on section 3, as I understand it. Perhaps you had better read section 3, as there may be some here who were not present before luncheon.

Mr. SCHWARTZ (reading):

SEC. 3. That it shall be unlawful for any person to manufacture, procure, or keep for the purpose of sale, offer or expose for sale, or sell, bread in the form of loaves, which is not of one of the weights specified in section 1, within such variations and tolerances as may be fixed by the * * *. Any person who, by himself, or by his servant, or agent, or as the servant or agent of another, shall violate any of the provisions of this act shall be guilty of a misdemeanor and shall be punished by a fine of not less than $25 nor more than $200 upon a first conviction in any court of competent jurisdiction; and upon a second or subsequent conviction in any court of competent jurisdiction he shall be punished by a fine of not less than $50 nor more than $500, or by imprisonment in the * * * jail for not more than six months, or by both such fine and imprisonment, in the discretion of the court.

Mr STEWART. I move the adoption of the section as read.

(The motion was seconded.)

The CHAIRMAN. Are there any remarks? [After a pause.] If not, the question is on the adoption of the section.

(The question was taken, and the motion agreed to.)

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[10] The text of the model bread law as adopted by the conference will be found in Appendix II, p. 131.

Mr. SCHWARTZ. The next is section 4:

SEC. 4. The word "person" as used in this act shall be construed to import both the plural and the singular, as the case demands, and shall include corporations, companies, societies, and associations.

Mr. STEWART. Mr. Chairman, I would like to make a motion for the adoption of that section and of the report as a whole.

(The motion was seconded.)

The CHAIRMAN. Are there any remarks? The question now is on the adoption of the whole bill, the preceding three sections, as previously amended, and section 4 as read.

(The question was taken and the motion was agreed to.)

The CHAIRMAN. We will have this printed so that you can take copies of it away with you.

DISCUSSION OF TOLERANCES AS APPLIED TO BREAD WEIGHTS.

The CHAIRMAN. The next item which we will take up for the afternoon session is a general discussion of matters of interest.

Mr. STEINEL. There are two points on which I think we ought to have a little discussion in regard to the report which has just been approved. One point is about the number of loaves to be taken to strike an average in determining weights. Another point is the time limit after baking when the bread is to be weighed.

The CHAIRMAN. And the very next question that is going to arise is what tolerance shall be allowed. I think it would be well to take some action, so that these gentlemen might act uniformly in regard to it.

Mr. SCHWARTZ. Then, why not do it by way of a resolution? Let Mr. Steinel introduce a resolution that the Bureau of Standards be requested to make tests and then formulate a set of tolerances that can be made applicable to this model law. Let them give us an idea, so that we can get it on a scientific basis.

The CHAIRMAN. If you do that I would like to have you include in it a permanent committee of three of this organization that will give special attention to this and that could work with the bureau, because it is quite essential, I think, to couple it up with this outside experience.

Mr. SCHWARTZ. I fully agree with you in that, Mr. Chairman, and I would suggest if the gentleman will offer a resolution as suggested, including a committee to act with the bureau, that would cover the matter.

Mr. STEINEL. I will offer that in the form of a resolution.

The CHAIRMAN. This is a very important matter. It illustrates exactly the point that you can not successfully enforce any law if it is not complete in all respects.

Mr. FOSTER. This is the Massachusetts tolerance as prescribed by the Director of Standards:

Bread manufactured for sale or sold or offered for sale in the standard units of 16 or 24 ounces, or multiples of 1 pound, as prescribed by section 16 of chapter 418 of the acts of 1920, shall be deemed to be of the required standard weight, provided that the actual weight shall be within 4 per cent in deficiency or within 12 per cent in excess, as compared with the prescribed standard weight. The weight of loaves of other than the standard weights prescribed by said section shall be deemed to be correctly stated, provided that the actual weight of such loaves shall be within 4 per cent in deficiency or within 12 per

cent in excess of the marked weight. Such discrepancies in any number of loaves shall be as often above as below the standard or marked weights, and the average weight of not less than 12 loaves, when weighed 12 hours after baking, shall not be less than the standard or marked weight of such loaves.

Mr. STUHR. In Nebraska we did not leave this open to rule or regulation. I believe you are going to have a great deal of trouble in enforcing these rules or regulations. Argument will come up from time to time, and unless the Bureau of Standards formulates some of these it will be a question that will not be very easily settled. The Nebraska law provides that 25 loaves shall be weighed at the place where the bread is manufactured, provided it is in the State. The tolerance is 2 ounces to the pound. In other words, the bread must weigh between 16 and 18 ounces, and it must maintain this standard weight for 24 hours. All bread shipped into the State must meet these specifications, and in that case it is weighed at the place where it is offered for sale. Before the selection of these there was considerable experimental work done. There were hearings on the subject, and it was very thoroughly thrashed out.

Mr. HOLWELL. I think Mr. Schwartz's suggestion, and yours, too, for a committee to cooperate with the bureau to establish tolerances and also to determine the number of units we should sample is a good one. I informed Mr. Holbrook to-day that I intend going back to New York to make a survey of the bread situation in the city of New York more comprehensive than the one I mentioned yesterday. I shall undertake to cover the entire city in an effort to learn just how bread is sold, the weights of the bread of the various manufacturers, including the smaller bakeries. I intend to submit a report of that to you, Doctor, in order that the bureau may know just what we are doing in New York, and I trust it will assist this committee to come to a decision as to tolerances.

Mr. CUMMINGS. I would state that the deficiency tolerance in Massachusetts was adopted as the result of a number of reweighings of loaves for a period of more than 30 days, and we found that it well covered the maximum shrinkage that might reasonably be expected to occur from natural causes—4 per cent in deficiency.

The CHAIRMAN. The gentleman from Nebraska has brought up a very important point there that always comes up in every form of tolerance. There are two ways of stating a tolerance. You can set your standard and speak of the variations on either side, or you can set the two limits and say it shall be between them. The latter method is to be preferred, as a rule, but we meet many different forms of that. When you have your standard and fix a limit, there is a tendency to take advantage of the limit. You have endeavored to prevent that by saying that as many shall fall above as below, and you also have fixed a larger amount for your tolerance in excess. You say 12 per cent over and 4 per cent below. That is safe so far as the public is concerned, and no doubt that will be taken care of by the manufacturer, but when you can do so it is better to set the two limits of a tolerance—to say the thing shall fall between two limits and stop right there.

I trust this committee on tolerances will go into this thing rather carefully and give us some definite information on it. I hope, also, that the functions of the committee may be made broader than that. It ought to be enabled, I think, to take up any question regarding this

bread matter, to hold such investigations as it sees fit, and be posted as to the whole situation at the meeting next year, and if necessary hear the manufacturers or their representatives, and hear the sealers, and so on. If there is no objection I would suggest that your committee be given still broader power than merely to recommend tolerances. Is that agreeable, Mr. Steinel?

Mr. STEINEL. Yes.

The CHAIRMAN. That is to say, we will have this committee as a sort of bread committee that will be going into this study during the year and will report to us at the next conference.

Mr. SCHWARTZ. As I understand it, this was to be referred to the committee on specifications and tolerances, cooperating with the bureau. That lets the bread committee out. Therefore, I move that the bread committee be discharged.

Mr. HOLWELL. Is it proper for a member of a committee to ask for his own discharge?

The CHAIRMAN. There is still another reason why it is out of order. There is another motion before the house that we must dispose of first. This motion of the gentleman from Wisconsin is before you, that we have a committee to study and recommend tolerances, as well as to take up other matters pertaining to bread legislation.

Mr. GOODWIN. I think this question ought to be referred to the present committee on specifications and tolerances. I think they are the best fitted to handle the subject and could handle it more intelligently than a new committee, because they have been working on tolerances for five years or more, have they not? Therefore, I would amend the motion that is pending by referring the matter to this committee.

(The motion to amend was seconded.)

Mr. WEBSTER. Speaking of tolerances, it seems to me that we are opening up a pretty broad subject. I have understood in the past that the Government has never adopted any tolerance on a commodity.

The CHAIRMAN. Why do you draw the line at commodities? You have tolerances on gasoline.

Mr. WEBSTER. On gasoline-measuring devices and weights or measures. But, as I have understood it, no tolerance has ever been adopted on any commodity.

The CHAIRMAN. But if you have a standard loaf, that is a measure, as the standard apple barrel is a measure, and the standard berry box.

Mr. WEBSTER. I am afraid that the manufacturers would take it that there was a tolerance on bread, and therefore they would make it 15½ ounces and take advantage of it the same as the meat packers might on wrapped hams, or anything of that sort.

The CHAIRMAN. Even so, in cases of that kind there must be a tolerance, because they can not always weigh the same. For instance, as an inspector what would you say should be the weight of a pound of butter below which you would not accept it?

Mr. WEBSTER. Personally, I never prosecute unless it is an ounce under weight. I think it is picayunish to prosecute for anything less than that amount. Of course, in a large number of pounds if it is half an ounce it might be considered.

The CHAIRMAN. You have practically done in the case of butter what you dislike to do with bread.

Mr. WEBSTER. Well, we have never gone on record. We have used our own judgment as to what should be a tolerance.

(The question was taken, and the motion was agreed to.)

The CHAIRMAN. The question is on the original motion as amended.

(The question was taken, and the motion was agreed to.)

The CHAIRMAN. It is carried, and the matter will be referred to the regular committee on specifications and tolerances.

GENERAL DISCUSSION OF WEIGHTS AND MEASURES PROBLEMS.

NECESSITY FOR SPECIFICATIONS AND TOLERANCES FOR HEAVY-DUTY AUTOMATIC SCALES.

Mr. REICHMANN. Mr. Chairman, in this general discussion there are two matters that I would like to bring up, and I would like to put them in the form of motions. The first is, that one of the orders of business of the next annual conference be the question of automatic-indicating scales with capacities of 500 pounds and over.

There are no definite specifications on these scales in the specifications adopted by any previous conference. The subject is one that is receiving very considerable attention by industrial plants. I know from personal experience that a number of them are setting very peculiar, arbitrary rules, and some of their purchasing agents have nothing to guide them.

I move that one of the orders of business for the next annual conference be that subject, and that the committee consider drawing up specifications for consideration at the next conference on automatic indicating scales of 500 pounds and over.

The CHAIRMAN. You have heard the motion. I like the precedent which is being established here. I think we should always as far as possible bring up the subjects to be discussed at the next meeting.

Mr. REICHMANN. I will frankly state to you that that is a matter which is going to be taken up by the English Board of Trade within the next year very seriously. I was asked by a prominent Englishman what the Bureau of Standards or the conference had done in relation to this particular kind of scales, and I could not give him any information. But I did, as a matter of pride, tell him it was a matter that had been agitating the members of the conference considerably, and I did not think that there was any doubt but what this subject would be taken up very soon.

(The motion was seconded, the question was taken, and the motion was agreed to.)

NECESSITY FOR REGULATIONS IN RE FABRIC-MEASURING DEVICES.

Mr. REICHMANN. I now move that the committee on specifications and tolerances prepare specifications and tolerances for fabric-measuring and automatic-computing devices embodying the principle, as follows: A linear measuring device that automatically computes the money value (at a given price per unit of length) of the article measured shall have a correct computed money value for every length indication that is shown on the linear measure indicator.

There are a great many of these machines in the United States, and they are of various makes. They have been brought to the

attention of manufacturers and sealers and the public generally, very pointedly through some of the excellent work done by the State of Massachusetts and the State of New York, in which they have a specification, particularly applicable also to computing scales, that where you have an automatic indicating and computing device it must show the computed value wherever there is an indication.

I would like to add to that motion that the conference request at the same time that the Bureau of Standards prepare a field-test plan for such measuring devices, to be submitted to the next conference, so as to bring about a state of uniformity and equity all around.

The CHAIRMAN. If the bureau does that, we do not want to be accused of going into these things that you yourselves claim the right to do.

Mr. REICHMANN. My only reason for bringing in that as a part of my motion is that the question of technique in laying out a field method of test is a matter that in some instances is very important. And really most of the individual departments in cities and counties, and so on, are not equipped to handle that from the technical end; that is, I mean from the scientific technical end. In view of the fact that the conference tolerance committee is not a part of the bureau, I made that part of the motion as to the bureau.

The CHAIRMAN. The point is very well taken. The bureau will agree to do that. In all such cases as that we simply look upon ourselves as a medium for getting the information on which you base your decision.

(The motion was seconded, the question was taken, and the motion was agreed to.)

NECESSITY FOR REGULATION OF TANK WAGONS.

Mr. BARRON. I would like to ask that the committee on specifications and tolerances be instructed by the conference to consider the subject of drawing up specifications and tolerances on tank wagons and the appointments thereof, having in mind old tanks or tanks in use and also new tanks to be built according to the conference's ideas of what those tanks should be in order to be accepted as measures. There is a universal demand for this.

(The motion was seconded.)

Mr. GOODWIN. Mr. President and delegates, the increasing use of gasoline and lubricating oils has become such an important factor in the commercial life of every community that the question of the proper supervision of the sale of these commodities should be given close and mature consideration by this conference. I have discovered conditions which lead me to the conclusion that the sale of gasoline by wholesale dealers, as delivered by their tanks, is a veritable menace to honest measure, which should be corrected at once by this association.

The CHAIRMAN. Are there any further remarks?

Mr. STEWART. First, I want to state my position as that of being absolutely opposed to using a tank at all as a measure. I want to tell you some little experience I have had in that. A tank wagon got into a wreck. The connection to the spigot was broken off. They had to take that piece out and put a new one in. When they put the new one in it extended up into the tank perhaps three-quar-

ters of an inch or more, and it was impossible to get all the fluid out of that tank. That is one of my objections. Another objection is that in unloading a tank it must stand on a perfect level. If it does not, there is gasoline left in one end of the tank or the other.

(The question was taken, and the motion was agreed to.)

REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES, PRESENTED BY F. S. HOLBROOK, CHAIRMAN.[11]

Mr. Chairman and gentlemen, your committee on specifications and tolerances respectfully submits its report to the Fourteenth Annual Conference for consideration and action thereon.

For the convenience of the delegates this report has been arranged in two parts. Part I contains amendments to the specifications of such a character that a material change in the form or meaning of the specification is believed to be involved. These changes are recommended by the committee because the committee feels that they are necessary or desirable and improve the specifications as a whole.

Part II contains amendments to the specifications of such a character that but little change in meaning is believed to be involved. The committee feels that the proposed amendments would be advantageous, since they clarify the ideas and present them in a somewhat better form.

It is to be understood that the above classifications are very general in their terms and the classes are necessarily overlapping ones, since the making of any changes in the wording of a specification is apt to modify its meaning somewhat. However, the committee feels that, on the whole, the above explanation is a fair statement of the case, and that the division may prove useful to the delegates.

The old members of your committee desire at this time to announce with very great regret the retirement of Charles G. Johnson from this committee on account of the fact that he has resigned his official position as State superintendent of weights and measures of California. Mr. Johnson was a thorough, painstaking, and conscientious member and a splendid associate, and we feel that his resignation is a distinct loss to the committee and to the general cause of weights and measures.

The old members of your committee, however, consider the conference fortunate in the acquisition by the committee of W. T. White, director, State bureau of weights and measures of New York, and are certain that in his appointment to fill the vacancy a valuable member has been procured who will be of the greatest assistance in carrying on the work devolving upon the committee. Both Mr. Johnson and Mr. White subscribe to the recommendations contained in this report.

Respectfully,

(Signed) F. S. Holbrook,
Wm. F. Cluett,
W. T. White,
Committee on Specifications and Tolerances,
Annual Conference.

[11] The text of the specifications and tolerances for liquid-measuring devices as amended by the conference will be found in Appendix I, p. 123.

DISCUSSION OF REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES.[12]

The CHAIRMAN. I take it that it will be unnecessary to read the suggestions of the committee as a whole, since they are rather voluminous and you have copies of them in your hands; but the material will now be read section by section for discussion and action thereon.

Mr. HOLBROOK. The first suggestion of the committee is an amendment to specification No. 3, the amendment consisting of the following recommendation:

Strike out the first sentence and insert in lieu thereof the following: "*All liquid-measuring devices shall be so designed and constructed that they will be in normal operating position when they are in level.*"

The sentence which it is suggested be stricken out reads as follows:

The longitudinal axis of the measuring cylinder or chamber shall be accurately plumb when the device is in level.

Shortly after the last conference the committee's attention was called to the fact that there might be liquid-measuring devices built in which the cylinder might be laid on its side or placed at an angle. They might be designed to operate in that manner. The intention of the committee last year was merely to the effect that when the measuring device was so designed that the cylinder was intended to be plumb it should, in fact, be plumb when the device was in one position, namely, level.

In view of that suggestion the committee, under the authority of the conference to incorporate their conclusions in regard to which provisions should be made retroactive and which should take effect in the future, bracketed that sentence and provided that it should not take effect until July 1, 1921. We now suggest the change that liquid-measuring devices shall be so designed and constructed that they will be in normal operating position when they are in level, and the requirement is made that they shall be installed plumb and level. In that case when properly installed they will be in normal operating position.

The CHAIRMAN. You have heard this suggested amendment to the specification. Are there any remarks or any questions?

(It was moved and seconded that the amendment be adopted, the question was taken, and the motion was agreed to.)

Mr. HOLBROOK. The next suggested amendment is one which is not on the copy which you have, since it has been decided upon by the committee within the last few days. Present specification No. 5 is to the effect that liquid-measuring devices shall be of a capacity of 1 gallon, a multiple of the gallon, or a binary submultiple of the gallon. The committee now recommends that in addition to those sizes a $2\frac{1}{2}$-gallon pump be allowed, and therefore suggests that after the words "a multiple of the gallon" in the old specification the words "$2\frac{1}{2}$ gallons" be added.

(It was moved and seconded that the amendment be adopted.)

Mr. CUMMINGS. Several months ago, some time after the last conference, in Massachusetts, the specifications which were adopted at

[12] The text of the specifications and tolerances for liquid-measuring devices as amended by the conference will be found in Appendix I, p. 123.

that conference were published in pamphlet form, together with two additional specifications that were adopted subsequent to the conference at a meeting of Massachusetts sealers. Those specifications are now being more or less rigidly applied in Massachusetts. Our experience in Massachusetts has been that a pump with a 2½-gallon delivery, in connection with a 2-gallon delivery, was one which might facilitate the perpetration of fraud, and it is not allowed by our specifications. The consensus of opinion in Massachusetts is against any change.

Mr. Holbrook. In relation to this I may state that there was submitted to the Bureau of Standards for test a 2½-gallon pump. It was tested very carefully, and a copy of the report of that test was made available to the committee. It appears that on account of the fact that gasoline is so generally sold in 5-gallon units and 10-gallon units these amounts could very readily be arrived at by two or four strokes of this device.

Mr. Foster. It is a very easy matter for an operator of this 2½-gallon pump to stop at 2, and by giving two strokes of the piston give the customer 4 gallons and charge for 5. That seems to be the real objection to a 2½-gallon pump in the eyes of the sealers who have had experience with this particular pump. It was for that reason that there was adopted the Massachusetts regulation to which Mr. Cummings has referred. It is a device, in our opinion, that might be used for the perpetration of fraud. I sincerely hope that this recommendation will not be adopted.

Mr. Barron. I did not get the real idea of the last speaker. Why is it easier to defraud with that than it is with a 5-gallon pump equipped with a 4-gallon stop? I think that is a matter of supervisory work.

The Chairman. I presume the point made is that the full stroke is 2½ gallons in one case and 2 gallons in another.

Mr. Foster. That is the point, a 2-gallon stroke is used instead of 2½.

The Chairman. Is it clearly marked?

Mr. Holbrook. It must be under the specifications. We think the 2½-gallon size is unobjectionable, without taking into account any special pump, on account of the fact that gasoline is sold so generally in 5-gallon units, and this is one-half of that unit which is so commonly called for. I do not know whether the objection of the gentleman is directed to the capacity of the pump or to other points which are not under consideration now. We are merely directing our attention to the total capacity.

Mr. Cummings. The particular objection is that Massachusetts has adopted specifications with which the manufacturers in general are complying. We think they are good specifications. The sealers of weights and measures in Massachusetts have adopted those specifications after mature deliberation, and regardless of what action this conference might take in permitting the use of a 2½-gallon stop, I do not think Massachusetts will change their specifications. I do not think the sealers will stand for it.

Mr. Reichmann. I am very much interested in this very proposition and am very glad to learn from the tolerance committee which reported the change that they have made some very exhaustive tests

at the bureau. Independent of that I had also made some tests, and I can not see, to save my life, how there could be any injury done to the consumer with this particular type of device which otherwise would be arbitrarily ruled out. I move the question.

(The question was taken and, upon a division, the vote was declared a tie.)

(It was moved and seconded at this point that the conference adjourn, the question was taken, and the motion was agreed to.)

(Thereupon, at 4 o'clock p. m., the conference adjourned to meet at 10 o'clock a. m., Thursday, May 26, 1921.)

SEVENTH SESSION (MORNING OF THURSDAY, MAY 26, 1921).

The conference reassembled at 10 o'clock a. m., at the Bureau of Standards, Dr. S. W. Stratton, chairman, presiding.

DISCUSSION OF REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES—Continued.[13]

The CHAIRMAN. Yesterday at adjournment we were discussing the report of the committee on specifications and tolerances. We had just taken a vote on an amendment to specification No. 5, which was a tie. The Chair would prefer to have a broader discussion. All manufacturers, of course, have a free voice here, and we welcome their suggestions, but the voting will have to be confined to the official delegates.

Mr. HOLBROOK. To refresh your minds on this point, the committee recommends in specification No. 5 after the words "a multiple of the gallon" that the words "2½ gallons" be added. The specification as it stands at present states that pumps shall be made in capacities of 1 gallon, a multiple of the gallon, or a binary submultiple of the gallon. In view of the fact that gasoline is very generally sold in 5 or 10 gallon amounts, and these amounts can be measured by two strokes or four strokes, respectively, on a 2½-gallon pump, the committee is of the opinion that this size pump should be allowed.

Mr. REICHMANN. Mr. Chairman, representing Kentucky, as I spoke on this yesterday, I would like to briefly state again what I said yesterday, as many of the delegates were not here. There are quite a number, a great number, of pumps in use in the country on which there is a 2½-gallon stroke. The attitude that I have always taken is that if the pump does, in fact, deliver 2½ gallons, which it purports to deliver, there is no reason why a 2½-gallon stroke should not be allowed. If it is a question of detail as to stops, that would come under an entirely different specification. If it is a question of inaccuracy in delivery, that is a question of supervision for the sealers.

Mr. C. C. RAMSDELL (representing Gilbert & Barber Manufacturing Co.). We do not build a 2½-gallon pump, but I do not see the point of this objection. It has been said that the operator can stop his stroke at two and with two strokes furnish the consumer with 4 gallons, when he supposes he is getting 5. It seems to me if this is an objection to the 2½-gallon pump, it is an objection against all stops on pumps. Personally, I should favor the report of the committee.

Mr. FRARY. Mr. Chairman, Mr. Cummings, of Massachusetts, and the other delegates of that State are unable to be present this morning on account of an engagement at the Capitol. He asked that the vote on this matter be postponed until this afternoon's session. I therefore move that action upon this specification be postponed until the afternoon session to-day.

(The motion was seconded.)

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[13] The text of the specifications and tolerances for liquid-measuring devices as amended by the conference will be found in Appendix I, p. 123.

Mr. REICHMANN. There is a great deal to be done with the specifications. This is the last day of the conference, and there are the election of officers and reports of other committees, etc. I know that there is going to be considerable discussion of many other points. Personally, I think this is a very minor point. I think there is no place where it has been brought up except in the State of Massachusetts. If we defer action on this now, we might have the same situation as to every other point. Simply in the interest of expediting the matter I would like to see the motion not prevail.

Mr. BARRON. I can see no valid objection to the recommendation to allow a 2½-gallon pump. I think if we bar a 2½-gallon pump we are unnecessarily and arbitrarily doing something which no weights and measures men should do; that is, to bar a device which we earnestly believe can be properly used by a reasonably careful man to deliver to a customer the amount he is paying for. That, in my opinion, is the sole object of weights and measures regulations. If the pump in question meets that statement of facts, I can not see any objection to it.

(The question was taken, and the motion was rejected.)

The CHAIRMAN. That brings us to the question of the adoption of the amendment as it has been read.

(The question was taken, and the motion was agreed to.)

Mr. HOLBROOK. The next amendment is to specification No. 8, the recommendation reading as follows:

> At the end of the first paragraph add the following: "Provided, however, That when a liquid-measuring device is operated faster than normal speed of operation the tolerance shall be applied in deficiency only; that is, the liquid-measuring device shall not be deemed to be incorrect by reason of the tolerance in excess being exceeded during such operation."

The first paragraph of specification No. 8 now reads as follows:

> Constancy of delivery.—The amounts delivered by any liquid-measuring device shall not vary from the standard by more than the tolerances hereinafter provided, irrespective of the speed at which the apparatus is operated and, subject to the conditions of the special test described below, irrespective of the time elapsing between operations.

Just a few words in explanation of that specification. After very careful examination we have found the following phenomena in the case of piston-type pumps: Many piston-type pumps in perfect mechanical condition will deliver the correct amount of liquid when the pump is cranked slowly, will deliver the correct amount of liquid when the pump is cranked at what might be termed "normal" speed—about the speed which the average operator would normally use—but when pumped very rapidly, the stroke being finished very rapidly against the stop, an excess is often delivered, which is usually greater than the tolerance as at present provided.

The explanation of this excess is a very simple one. When you start cranking a pump rapidly you put in rapid motion a large volume of gasoline, that gasoline being, of course, in rapid motion from the level of the liquid in the tank to the end of the outlet line. That liquid has a great deal of inertia and possesses energy which is proportional to the speed at which the liquid is flowing. In other words, the faster the liquid is going the greater the energy, and the liquid tends to keep in motion after the stroke of the piston is stopped.

All the valves in the line necessarily open in an upward direction. If the energy of the liquid column is great enough the valves will be momentarily held open after the stroke is stopped and an indeterminate quantity of unmeasured gasoline will pass through the system. That energy will be dissipated very quickly, due to the fact that the gasoline is rising against gravity, to the fact that the valves are tending to close against it, to the friction of the liquid against the pipes and the walls of the chamber, and perhaps to some other causes.

Bear in mind that this excess only occurs when the pump is stroked rapidly and stopped suddenly. Bear in mind also that effect is always overmeasure. Bear in mind also that this happens when the pumps are in perfect mechanical condition; this is not an effect of the imperfect condition of a pump. The operator of the pump can by operating it in this manner give overmeasure, and the cause of that overmeasure is entirely within his control. He can operate the pump in a normal manner and see to it that overmeasure does not result.

After very careful consideration the committee is of the opinion that the mere fact that the pump throws overmeasure under the conditions which I have detailed is not a sufficient cause for the condemnation of the pump. Therefore they suggest the addition of certain words to the specification, which words are so designed as to provide that under the specific conditions which I have pointed out the pump shall not be condemned because the tolerance in excess is exceeded upon a fast stroke. A tolerance in deficiency, if exceeded, will be sufficient for condemnation, but the tolerance in excess is extended, if you please, on account of the facts which I have endeavored to detail.

(It was moved and seconded that the amendment be adopted, the question was taken, and the motion was agreed to.)

Mr. Holbrook. The next is an amendment to specification No. 21. This specification allows two discharge outlets under conditions which are designed to protect the operator of the pump and the person buying gasoline from inaccuracy due to the fact that there are two discharge outlets. The recommendation is to the effect that after the words "period of discharge" near the end of the second paragraph the following words be inserted:

and the closure shall be so effected that delivery made through one discharge outlet shall not affect the subsequent delivery through any other discharge outlet.

This makes paragraph two of the specification read, in part, as follows:

Also, when two or more discharge outlets for the liquid are provided all outlets except the one in use must automatically be tightly and completely closed off during the period of discharge, and the closure shall be so effected that delivery made through one discharge outlet shall not affect the subsequent delivery through any other discharge outlet.

It has been pointed out that a pump might be constructed, and I think perhaps some pumps have been so constructed in the past, that when one discharge outlet is used not only the measured liquid was delivered but a certain excess was delivered which was drawn from the other discharge line. In other words, under those conditions a

customer buying from that outlet would get overmeasure and would take that overmeasure, that excess, from the next purchaser, who would necessarily get the amount of shortage equivalent to the amount of liquid which was required to fill that line which had been partly drained. It seems to the committee that there should be very little argument on the question that one customer should not get something belonging to another customer.

I am not sure that pumps are being so built at the present time as to allow this to be done, but whether or not they are being built I think it will be granted that they should not be built. It may be that the intent of this specification is obtainable through the enforcement of tolerances, because if the inspector should draw first from one outlet and then from the other outlet, and should find one outlet was overmeasuring and one undermeasuring, the pump would be condemned anyway. But we think the matter is important enough to be covered in a specification, and therefore we have recommended the addition of these words at this place.

(It was moved and seconded that the amendment be adopted.)

Mr. Goodwin. I think a very simple device could be constructed to prevent anything of the kind occurring. Have you recommended a device?

Mr. Holbrook. We never recommend a device.

(The question was taken, and the motion was agreed to.)

Mr. Holbrook. Returning to specification No. 21 just a moment for the sake of simplifying the explanation of the amendment to specification No. 22, the former specification provides that all liquid-measuring devices shall be so designed and constructed that no portion of the measured liquid can be diverted from the one discharge outlet through which delivery is being made or to be made during the operation of the liquid-measuring device. Specification No. 21, then, contemplates under certain conditions more than one outlet. Specification No. 22 as at present worded appears to forbid more than one discharge outlet unless one of them is controlled by a mechanically operated valve.

With the addition that we have already made to specification No. 21, providing that deliveries through one outlet shall not affect subsequent deliveries through the other outlet, it no longer is necessary to forbid, in the opinion of the committee, more than one discharge outlet on a liquid-measuring device. Therefore the specification has been reworded to provide against the trapping of a portion of the measured liquid, and if this is made impossible, and if under specification No. 21 one outlet can not affect the deliveries from the other—both must be correct—then there seems to be no reason why two outlets should not be allowable. Therefore the committee has suggested that the first paragraph of the specification be stricken out and that the following be inserted:

No liquid-measuring device shall be equipped with a shut-off valve at the extremity of the hose or elsewhere in the hose line except in the case of devices designed and constructed so that they must be operated with the hose full of liquid at all times. In case such valve is used any other valve in any portion of the discharge line leading to this outlet must be so designed and constructed that it can only be closed off by the use of some tool or device which is outside of and entirely separate from the measuring device itself, such as a wrench, screw driver, etc., but not an adjusting pin.

That specification as reworded allows the valve in the end of the hose under the same conditions that the valve in the end of the hose was allowed last year. It does not allow two manually operated valves such that at the beginning of a delivery one near the pump can be turned on and at the end of the delivery one at a distance from the pump can be turned off. I may say that evidence has come to our hands that that practice was sometimes followed by unscrupulous operators. But in case the purchaser is adequately protected in other respects two manually operated valves are allowed under the terms of this specification, the second manually operated valve to be in some other portion of the delivery line than the portion which leads directly to the first manually operated cut-off valve. It is not necessary under the present amendment to strike out the words "shut off" in the title. Therefore, that recommendation may be considered as withdrawn.

The second paragraph has been changed by striking out the words "two shut-off valves or cocks" and adding the words "a shut-off valve in the hose," to conform to the amendment made in paragraph No. 1. Paragraph No. 3, under the new wording, becomes meaningless and is therefore struck out *in toto*.

(It was moved and seconded that the amendment be adopted, the question was taken, and the motion was agreed to.)

Mr. HOLBROOK. The next is an amendment to specification No. 26, reading as follows:

At the end of the specification add the following: "*And provided further, That nothing in the above shall be construed to prevent the omission of all value graduations from a clear interval between the zero graduation and any subsequent graduation.*"

making the specification read that certain graduations must be provided with this exception.

There was a great deal said last year about the omission of some of these smaller quantity graduations, and many of the manufacturers indicated their intention of cutting off some of these. Certainly there should be no objection if the manufacturers desire to leave off computing graduations over that range also, because if there are no quantity graduations and a manufacturer does not intend to make it possible to measure those small amounts there is absolutely no reason for requiring computing values there. It seems, however—and this is somewhat doubtful—that perhaps those graduations are at present required, and we certainly want to make it perfectly plain in the specification that they do not need to be put there unless the manufacturer desires to put them there.

(It was moved and seconded that the amendment be adopted, the question was taken, and the motion was agreed to.)

Mr. HOLBROOK. The next is an amendment to specification 27, as follows:

After the word "devices" insert the words: "and all devices designed to be attached thereto and used in connection therewith"—

making the specification read as follows:

No. 27. Fraudulent construction prohibited.—All liquid-measuring devices and all devices designed to be attached thereto and used in connection therewith shall be of such construction that they are not designed to and may not be used to facilitate the perpetration of fraud.

A number of auxiliary devices are now coming on the market, and it certainly seems reasonable, if we do not allow a fraudulent pump in use, that we should not allow a device to be attached to the pump which would be fraudulent in its effect, whether the original manufacturer installs it or whether it is a device manufactured by somebody else intended to be installed on the original manufacturer's product.

(It was moved and seconded that the amendment be adopted, the question was taken, and the motion was agreed to.)

Mr. Holbrook. The next matter is the question of tolerances, and here the committee has merely presented a number of alternatives to be considered by the delegates; the committee has made no recommendation as between a number of different systems of tolerances. They suggest, first, that the following words be added at the beginning of the tolerance paragraph: "Except on special tests described above."

Those words are rendered necessary by the adoption of the specification that the tolerance in excess may be exceeded at the conclusion of a fast stroke. The committee then appends the following note in regard to values of the tolerances:

In regard to the values of the tolerances, if the present ones are not considered satisfactory, the following alternatives are offered for consideration.

The committee is firmly of the belief that the tolerances on fractional parts of a gallon can not be made the same fractional part of the tolerance on 1 gallon that the delivery is of 1 gallon. However, it was assumed last year, and perhaps with some reason, that the tolerance on a half gallon would be half the tolerance on a gallon: that the tolerance on a quart would be one-quarter of the tolerance on a gallon; that the tolerance on a pint would be one-eighth the tolerance on a gallon; and that the tolerance on a half pint and 1 gill would be one-sixteenth and one thirty-second, respectively, of the tolerance on a gallon. Very quickly in going down the line in this manner you will come to a point where the tolerance is so small that the sealer will be wholly unable to measure it. In the field measurements can be made with accuracy down to a certain point, and beyond that point accuracy is unobtainable.

The committee last year recommended that the tolerance on a gallon should be 2 cubic inches, and that additional tolerances of 2 cubic inches per measured gallon should be allowed, without giving enough consideration to how that would be interpreted on amounts less than 1 gallon. It subsequently developed that in the opinion of some delegates the tolerances should decrease proportionately with deliveries, but I think that all you men who are practical men realize that to attempt to measure within an accuracy of one-eighth of a cubic inch, for instance, in the field and to condemn a pump on a one-eighth-inch error would be an entirely impracticable proposition.

The same theory is recognized in the case of scales. The scale-tolerance table is given, and it is automatically interrupted from further decrease at a certain point—in the case of automatic scales, for instance—by the provision that the tolerance in the table shall apply, provided, however, that the tolerance shall never be less than one-quarter of the minimum graduation on the reading face. That means that while the table may show one-sixteenth ounce, one-

eighth ounce, and one-fourth ounce, nevertheless, if the minimum graduation is 1 ounce the tolerance to be applied to the scale is never less than one-fourth ounce.

The committee believes that similarly in the case of gasoline pumps—and while this is not an exact analogy it is, nevertheless, a close analogy—the tolerance should decrease down to a certain point, and that then below that point the same tolerance should be allowed on all values, and that that tolerance should be one which can easily be read by the sealer.

You can not do better than that. Anyone who has attempted to make observations knows there is a limit of accuracy beyond which he can not readily go. That limit of accuracy necessarily can not be considered as a tolerance. Suppose from all the causes of error probable the sealer's determination may be half a cubic inch in error. In our opinion the tolerance on a device should be some four or five times that error which it is probable the sealer will make.

In the case of weights we know that we carry in the field certain test weights. We know that those test weights themselves may be in error by any amount up to the limit of tolerance on test weights. Then, the limit of tolerance on commercial weights is made four or five times the tolerance on the test weights of the sealer, for the reason that if the tolerance was not very considerably larger too large a proportion of the commercial tolerance would be absorbed in the error on the test weight itself. In other words, to return to the consideration of pumps, the pump can not, in practice, be allowed the entire tolerance granted to it; but a certain proportion, which should be a small proportion, will be taken up by the more or less constant error of determination. Roughly, the error of determination may be said to consist of the error on the sealer's measure, which necessarily has a tolerance, the error due to spillage or evaporation, the error due to the trapping of a small amount of gasoline in the hose, the error due to inaccurate filling of the test measure, and the error due to inaccuracy of reading.

Those items will all be added together to make an inaccuracy in the sealer's determination, and then in good practice it must be considered that the tolerance on the device should be perhaps four times as large as that probable inaccuracy, so that the device will be allowed a sufficient tolerance in itself and too much of the value given will not have been absorbed by the error which the inspector may have made.

To return to the suggestions of the committee, the first alternative, lettered "A," is given if you think the present tolerances are satisfactory, and it provides that the specification be amended simply to provide that on 1 gallon or less the tolerance shall be 2 cubic inches, and on amounts greater than 1 gallon it shall be 2 cubic inches per gallon.

We have heard, however, some discussion among the inspectors to the effect that while the tolerances on small amounts were not too large, and possibly in the opinion of some too small, nevertheless, to allow 2 cubic inches on every gallon delivered, resulted in the tolerances on the larger amounts being very much too large. It has been pointed out, and reasonably, that some errors will show up just as prominently on the first gallon delivered as on the capacity

of the pump, for instance, 5 gallons. If there is a slight leakage due to standing and you pump 1 gallon you will have 1 gallon minus that leakage, and if you pump 5 gallons you will have 5 gallons minus that leakage. Therefore, they have considered that a straight line tolerance of 2 cubic inches per gallon resulted in too much tolerance on the larger quantities. With this thought in mind the following four tables were prepared for your consideration:

Table 1.		Table 2.		Table 3.		Table 4.	
Delivery.	Tolerance.	Delivery.	Tolerance.	Delivery.	Tolerance.	Delivery.	Tolerance.
	Cubic inches.		*Cubic inches.*		*Cubic inches.*		*Cubic inches.*
.....	.....	.....	.....	1 pint or less....	1.0	.....	.....
.....	.....	.....	.....	1 quart.....	1.5	.....	.....
.....	.....	½ gallon or less..	1.0	½ gallon.....	2.0	½ gallon or less..	2.0
1 gallon or less..	2.0	1 gallon.....	2.0	1 gallon.....	3.0	1 gallon.....	3.0
2 gallons.....	3.0	2 gallons.....	3.0	2 gallons.....	4.0	2 gallons.....	4.0
3 gallons.....	4.0	3 gallons.....	4.0	3 gallons.....	5.0	3 gallons.....	5.0
4 gallons.....	5.0	4 gallons.....	5.0	4 gallons.....	6.0	4 gallons.....	6.0
5 gallons.....	6.0	5 gallons.....	6.0	5 gallons.....	7.0	5 gallons.....	7.0
6 gallons.....	7.0	6 gallons.....	7.0	6 gallons.....	8.0	6 gallons.....	8.0
7 gallons.....	8.0	7 gallons.....	8.0	7 gallons.....	9.0	7 gallons.....	9.0
8 gallons.....	9.0	8 gallons.....	9.0	8 gallons.....	10.0	8 gallons.....	10.0
9 gallons.....	10.0	9 gallons.....	10.0	9 gallons.....	11.0	9 gallons.....	11.0
10 gallons.....	11.0	10 gallons.....	11.0	10 gallons.....	12.0	10 gallons.....	12.0

For deliveries of over 10 gallons add 1 cubic inch per indicated gallon.

Table 1 provides that the tolerance on 1 gallon or less shall be 2 cubic inches, and it adds 1 cubic inch per measured gallon above that.

Table 2 provides that the tolerance on a half gallon or less be 1 cubic inch—and this may be if it is believed that the sealer can be reasonably certain of results to one-fifth or one-fourth of a cubic inch—2 cubic inches on 1 gallon, and 1 additional cubic inch per measured gallon above that.

Table No. 3 provides a 3-cubic inch tolerance on 1 gallon. It goes down to 1 cubic inch, and further allows 1 cubic inch per measured gallon above the 1-gallon delivery.

Table No. 4 provides for 3 cubic inches on a gallon, a minimum of 2 cubic inches on one-half gallon or less, and 1 cubic inch per gallon above the 1-gallon point.

The committee has merely selected a number of ideas and put them into various tables and leaves it entirely to the judgment of the conference as to which system of tolerances is best.

Moreover, let me say this, that if anybody has an opinion which has not been expressed by the committee, because necessarily the committee, in the premises, can not suggest all the systems there are, I will be glad to write upon the blackboard, where everybody can see it, the system that anyone has to suggest.

The Chairman. Does the committee especially favor any of these systems?

Mr. Holbrook. The committee makes no especial recommendation.

Mr. Ramsdell. I should favor alternative A and the present tolerances, for the reason that in the time-elapsed tests that are made in some places considerable liquid will be absorbed in wetting the

hose and in wetting the measure, as was pointed out to us in Mr. Smith's paper yesterday, and in such tests quite a considerable amount appears as a shortage that really does not exist so far as the actual measurement is concerned.

Mr. HOLBROOK. In relation to time-elapsed tests, specification No. 8, in the second paragraph, provides that "a period of nonuse of six hours shall not result in an error of the first delivery of the device after such period of nonuse greater than 10 cubic inches or, in the case of a new liquid-measuring device, 5 cubic inches." Of course, this specification would not be changed unless there was specific action taken thereon.

Mr. RAMSDELL. In a test after a period of five or six hours, during which time the pump stands idle, the hose will become dry.

Mr. HOLBROOK. You remember, do you not, Mr. Ramsdell, the fourth paragraph of specification No. 8—

> In applying the six-hour test it is recommended that the delivery be not made through a hose, since the amount of gasoline necessary to wet the inside of the hose will cause an additional shortage in the delivery.

Mr. RAMSDELL. I had overlooked that. It is rather difficult to make a test without a hose on many of the pumps we are building to-day. It is rather difficult to make a test of that kind or to make any test without the use of the hose.

Mr. HOLBROOK. Mr. Ramsdell, I ask for information. Suppose that the gasoline is delivered through a hose and the hose is hung up, allowing the liquid to drain down into the loop of the hose. How much will evaporate, do you suppose, under reasonable conditions, in six hours? It has a very small nozzle from which to evaporate. I know it depends largely on the grade of gasoline, and there are many factors entering into it, but I thought perhaps you had some idea.

Mr. RAMSDELL. I think it is your intention, is it not, that the hose should be dry. That is the idea of the overhead discharge, so that every drop shall go into the buyer's tank. It leaves us an empty hose that is wet with gasoline that would perhaps dry out in the course of a few hours.

Mr. HOLBROOK. Necessarily, after the hose has been practically drained into the tank of the car, and it is hung up, there will some gasoline collect in the bottom of this loop. But it is certainly the intention of the committee, Mr. Ramsdell, that every precaution shall be taken to eliminate errors such as this, namely, the loss occasioned by the wetting of a dry hose. Investigations might be made by taking the ordinary hose and ordinary gasoline, making conditions normal in so far as possible, to determine how much it takes to wet the hose after six hours, and to suggest to the sealers that that amount be actually allowed, in addition to the tolerance, for wetting the hose in cases where the tests are made by delivering gasoline through the hose.

Of course on the pumps which come in to the bureau for test we remove the hose and add a short length of smooth pipe at an angle which can not collect any appreciable amount of gasoline, so that there will be no unknown factors entering into our results.

Mr. REICHMANN. May I move, then, that the conference request the Bureau of Standards to make the tests outlined by Mr. Holbrook,

and pending that investigation, the results of that test, that the tolerances allowed in section 8 stand as they would naturally anyway.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. Reichmann. On this tolerance I would like to make a motion. A great many of the delegates, apparently, from what I learn since being down here in the last two or three days, are in favor of alternative A. A great many of them, however, making an analysis and recognizing that the error curve is not a straight line function in ordinary measuring instruments, believe that there should be a smaller tolerance on 10 gallons than 20 cubic inches.

I suggest we adopt Table 4 as a fair compromise of all the tolerance tables suggested here.

Mr. Barron. I second the motion. I just want to say briefly that a careful study of the situation has led me to approve everything that Mr. Holbrook has suggested in regard to variations. Table 4 comes closer than the others to what we have found in practical field work to be almost a necessity on various types of pumps.

(The question was taken, and the motion was agreed to.)

Mr. Holbrook. We have now covered Part I of the committee report.

It is the mature conclusion of the committee that Part II contains amendments which clarify the meaning of specifications or make them a little smoother in their phraseology, but which really have very little effect upon the meaning.

There is suggested an amendment to specification No. 5. Strike out the word "prices" after the word "predetermined" and insert in lieu thereof the word "values."

(It was moved and seconded that the amendment be adopted, the question was taken, and the motion was agreed to.)

Mr. Holbrook. Specification No. 6. Strike out the word "the" before the word "piston" the first two times it occurs and insert in lieu thereof the word "a" in each case.

The use of the word "the" assumes there is necessarily a piston, and the word "a" indicates that only when there is one the specification applies.

(It was moved and seconded that the amendment be adopted, the question was taken, and the motion was agreed to.)

Mr. Holbrook. Specification No. 9. After the words "major ones" insert the words "are more prominent than and." In the last sentence strike out the words "as the sole means" and insert in lieu thereof the following: "which at some point or points or at all points constitutes the sole or most sensitive means." It was provided in the old specification that graduations be readily distinguishable one from the other, and this adds the idea that the major ones shall be more prominent than the minor ones.

Perhaps a few words on the second change are advisable, as to striking out the words "as the sole means" and adding the words "which at some point or points or at all points constitutes the sole or most sensitive means." We considered last year that when a pointer and scale were used and no stops the pointer and scale constituted the sole means of determining deliveries.

One manufacturer during the year suggested to us more in fun than in earnest, because he withdrew his suggestion immediately, that at some points the pointer and scale were not the sole means, even when stops were not used, because they had a clocking device which clocked off gallons one at a time and showed total deliveries, and they had a metering device which also expressed the total number of gallons. I think it will generally be admitted that the ordinary clocking device and totaling meter are not sufficiently accurate to determine deliveries, because they are very much less sensitive than the present pointer and scale.

Therefore, inasmuch as, technically speaking, this dial also indicates deliveries and the meter also indicates deliveries, although the pointer and the scale we know will universally be used because they constitute the most sensitive indicating means on the device, it is recommended that the wording of the specification be changed to read that the requirements take effect when the pointer and scale are the sole means or the most sensitive means of determining deliveries on pumps.

(It was moved and seconded that the amendment be adopted, the question was taken, and the motion was agreed to.)

Mr. Holbrook. The next is an amendment to specification No. 10. It was provided that "*the width of that part of the pointer or indicator which reaches to the finest graduation marks shall not be greater than the width of such marks.*" That carried the assumption that the pointer shall reach to the graduations, and yet that provision is not specifically incorporated. Therefore, it is recommended that the words which I have read be struck out and the following words substituted:

Such pointers and indicators as when used in conjunction with a graduated scale or dial constitute at some point or points or at all points the sole or most sensitive means of determining the amount of liquid discharged or the value of the delivery at a predetermined price per unit of volume, shall reach to the finest graduation marks, and the width of the pointer or indicator or of the end thereof shall not be greater than the width of such marks.

(It was moved and seconded that the amendment be adopted, the question was taken, and the motion was agreed to.)

Mr. Holbrook. Specification 13. It is recommended that we strike out the words "*lines and*" after the word "*graduation,*" and insert in lieu thereof the following:

marks and shall be as close thereto as practicable, but shall not be so placed as to interfere with the accuracy of reading. Such figures—

Making the specification read as follows:

Numbering of graduations.—Figures defining the value of graduations shall be uniformly placed in reference to the graduation marks and shall be as close thereto as practicable, but shall not be so placed as to interfere with the accuracy of reading. Such figures shall be in regular sequence; that is, sequences such as 5, 1, 2, 3, 4 shall not be permitted.

We have seen some visible devices in which the figures indicating the value of the graduations were offset 90 degrees from the graduations, so that if a person stood directly in front of the device and looked at the graduation he could not see the figure. If he stood directly in front of the figure, he could not see the graduation, and the only point at which he could see both would be at some point

about halfway between, where his eye would cover the figure and the graduation. We think the figures should be brought closer to the graduations than that, in order that there may not be mistakes in reading.

(It was moved and seconded that the amendment be adopted, the question was taken, and the motion was agreed to.)

Mr. Holbrook. Specification No. 15 has been entirely reworded, because the changes were such that they could not very readily be incorporated by specific insertions. The old specification reads as follows:

All markings, instructions, and graduations required under these specifications shall be such size, design, and location that they will not tend to become obliterated by dirt or oil, or for any other reasons tend easily to become illegible.

The suggested rewording is:

All markings, instructions, figures, and graduations required under these specifications shall be of such size, design, material, and location and shall be so applied or affixed that they will not tend easily to become obliterated or illegible.

(It was moved and seconded that the amendment be adopted, the question was taken, and the motion was agreed to.)

Mr. Holbrook. Specification 19 contained a clause exempting such devices as altered the price and delivery of liquid-measuring devices from the application of its provisions. We now submit that there is no device which can be attached to a liquid-measuring pump which will alter the price. The seller does that. Therefore, we suggest striking out the words "*price and consequently the delivery of*" and adding the words "*deliveries to conform to different prices per gallon on.*"

(It was moved and seconded that the amendment be adopted, the question was taken, and the motion was agreed to.)

AMENDMENT OF LIQUID-MEASURING DEVICE SPECIFICATION NO. 9.[14]

Mr. Reichmann. Mr. Chairman, I would like to bring up a question that was brought up here last year with rather detrimental personal results to a gentleman who had gasoline spilled over him. I am referring to this sentence in specification No. 9:

The graduations on all linear scales shall be parallel to each other and perpendicular to the longitudinal axis of the measuring chamber.

I move that we hear from Mr. Bean, who is interested in this matter.

Mr. F. A. Bean (representing Wayne Oil Tank & Pump Co.). I would like to ask the amendment of specification No. 9 by striking out the words "the graduations on all linear scales shall be parallel to each other and perpendicular to the longitudinal axis of the measuring chamber." Last year I believe it was the concensus of opinion that the large amount of objection was caused by the pointer that was used in connection with the scale rather than with the scale itself.

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[14] The text of the specifications and tolerances for liquid-measuring devices as amended by the conference will be found in Appendix 1, p. 123.

A number of designs were submitted to the committee, and I believe they are of the opinion that, with the adoption of some one of those designs, most of the objections—practically all of the objections—raised last year and which caused the amendment of this specification have been overcome. I do not believe it is the desire of the bureau or of the conference to cause a hardship on any manufacturer. The enforcement of this particular specification, however, does cause a very severe hardship. I do not think there is any question as to either the mathematical or mechanical accuracy of the scale, and when used in connection with the pointers which have been presented to the committee I do not see any objection to its adoption.

Mr. Neale. Mr. Chairman, it happens that I am here this year not as a delegate, as I have been for the last 12 years, but rather as your guest. The only reason I ask the liberty now to speak on the subject in hand is that at last year's conference it was I who proposed the amendment now under consideration.

I had in mind a widely used pump, in which the graduations on the scale are not parallel to each other. When I first saw such a scale I did not understand it. It is quite natural for men in weights and measures administration work to be fearful of machinery, or equipment, or the arrangement of things which they do not fully understand. Hence, I did not like the arrangement, but I was more discouraged and disappointed at the crude arrangement of the reading indicator that came against those lines at that time.

However, immediately after the last conference I went deeper into the matter, visited this large pump manufacturing company, and learned more of this arrangement, what it was, and why it was. I am now confident that that particular scale, with a properly refined pointer, is a scale that can be designed and can be read as correctly as any scale, even though the lines are not parallel to each other.

If that scale with a properly designed pointer results in just as accurate a reading as may be obtained with any other design, then I believe that Mr. Bean is not out of place here in asking that the possibly hurried action of the last conference be reconsidered at this time.

The Chairman. Has the committee anything to say on this?

Mr. Holbrook. I may state for the committee that while they have carefully considered this they have no settled conviction one way or the other on the matter. That is, as a committee they desire neither to recommend nor disapprove the amendment to the specification. I may say, moreover, that the committee did not originally propose this plan. It was proposed from the floor and adopted by the conference, and the committee has felt and feels that its reconsideration should come from the floor of the conference and be acted upon by the conference itself. If the committee had a conviction one way or the other, they would not hesitate to state that conviction. But, after careful consideration, they have arrived at the conclusion that they must remain absolutely neutral in relation to this matter.

Mr. Reichmann. Mr. Chairman, I would like to ask Mr. Holbrook a question. If a motion were made to strike out that one clause is there another specification which would cover the pointer feature?

Mr. Holbrook. I do not believe there is another specification that would require the adoption of such a pointer as Mr. Bean has sub-

mitted to the committee, for this reason, that the committee did not have that particular scale in mind in wording the specification in regard to indicators, and did not have to have it in mind, because the conference forbade the scale at the last session. Let me say that Mr. Bean's pointers are now such that they cut off all view of the line back of the pointer itself. The only portion of the line which can be seen is that part of it which may coincide with the pointer and the remainder from that point on. If it is desired to block off the remainder of that line, I do not believe there is any specification which covers the matter.

Mr. Reichmann. Mr. Chairman, may I move, then, that that particular clause be stricken from the specification and that the committee will have full power to act should there not be a specification that will cover the pointer feature instead of the scale feature?

Mr. Barron. I second the motion.

Mr. Frary. In regard to the scale or pump represented by Mr. Bean, I wonder if all of us are thoroughly familiar with the significance of this change. When the matter was up last year, those of us who were here then saw it demonstrated and understood the inaccuracies which might result through the use of the scale and the indicator. Mr. Holbrook has told us that the indicators now to be used by the manufacturers on this particular pump and in connection with this particular scale are of such a character as to cut off from the operator's and the buyer's view a certain portion of the line. I would like to ask Mr. Bean if the arrangement of this present indicator is such that it can be either removed farther from or drawn closer to the apparatus to which it is attached?

Mr. Bean. The new pointers are designed to be made of a tempered material, so that it will be impossible to bend them. Of course, they are adjustable in a horizontal plane. That is the purpose of the device itself. It can be adjusted, but that adjustment can be so sealed that it can not be moved at will. The operation of the pump is the same as it was last year. Those pumps had stops at 1, 2, and 5 gallons. Now 3 and 4 gallon stops are being added. The only points at which the scale would be used are the fractions of gallons.

(The question was taken, and the motion was agreed to.[15])

The Chairman. Now, I have a remark to make right here, and it will take but a minute. I am very glad you have taken this up, that you have acted upon it, and that you saw the necessity for making the change, and I want to ask the manufacturers that they trust this conference to do that very thing. It is not necessary to resort to any roundabout way such as the bringing to bear of any political influence. Since this matter has been passed, I want to say that in the last few days I have had calls from three Members of Congress regarding this point, asking the bureau not to put this out as passed before. It is the right of every member to appeal to his Representative in Congress for anything he wants, but please give these gentlemen the opportunity to act upon the thing and to go at it in the right way, and let us not introduce politics into these deliberations.

[15] The material referred to in this resolution is incorporated in liquid-measuring device specification No. 10. See Appendix I, p. 126.

REPORT OF THE TREASURER, FRANK WANSER, PRESENTED BY A. W. SCHWARTZ.

I beg to present the report of the treasurer, as follows:

Balance on hand, 1920 report	$49.85
Receipts, 1920 assessments, as per resolution	83.00
	132.85
Disbursements, printing bill, 1920 convention	13.50
Balance	$119.35

(Signed) FRANK WANSER,
Treasurer, Annual Conference.

The CHAIRMAN. I have had several suggestions that the afternoon meeting be held at the Raleigh Hotel. We will meet there this afternoon not later than 2 o'clock.

(Thereupon, at 11.45 o'clock a. m., the conference took a recess until 2 o'clock p. m., to reconvene at the Raleigh Hotel.)

EIGHTH SESSION (AFTERNOON OF THURSDAY, MAY 26, 1921).

The conference reassembled at 2.15 o'clock p. m. at the Raleigh Hotel, Dr. S. W. Stratton, chairman, presiding.

REPORT OF COMMITTEE ON RESOLUTIONS PRESENTED BY GUY G. FRARY, CHAIRMAN, AND DISCUSSION THEREON.

The committee on resolutions present the following resolutions, which I will read one by one for your consideration and action thereon. The first one is as follows:

RESOLUTION OF APPRECIATION TO THE SECRETARY OF COMMERCE.

Whereas the Honorable Secretary of Commerce, Herbert Hoover, very graciously gave of his time and energy to deliver an address at this Fourteenth Annual Conference on Weights and Measures: Therefore be it

Resolved, That this conference express its sincere thanks and appreciation to Secretary Hoover for the wise and kindly counsel given on matters of prime interest to every weights and measures official.

(The resolution was duly adopted.)

Mr. FRARY. The second resolution is as follows:

RESOLUTION OF SYMPATHY AND GOOD WISHES TO LOUIS A. FISCHER.

Whereas illness has made it impossible for Louis A. Fischer, our highly esteemed and faithful secretary, to attend the sessions of the Fourteenth Annual Conference: Therefore be it

Resolved, That this conference take this means of expressing its regret at his inability to be present and its sincere hope that health in full measure may speedily return to him.

(The resolution was duly adopted.)

The CHAIRMAN. The resolution was carried unanimously.

Mr. FRARY. The next resolution is as follows:

RESOLUTION OF APPRECIATION TO THE DIRECTOR AND STAFF OF THE BUREAU OF STANDARDS.

Whereas through the tireless and persistent efforts of Director S. W. Stratton and his able assistants from the Bureau of Standards, the weights and measures officials of this country have been able to render more effective service in their respective fields; and

Whereas each succeeding national conference has emphasized to the assembled delegates the invaluable advice and assistance rendered by the bureau in the various subjects discussed and in arriving at the proper conclusions: Therefore be it

Resolved, That this conference express to Director Stratton and his staff its appreciation and thanks for their notable services, for the delightful entertainment provided, and for making possible the success of this conference.

Mr. GOODWIN. Gentlemen, you have heard the resolutions read.

Mr. MOORE. I move that they be adopted as read.

(The motion was seconded.)

Mr. GOODWIN. It is moved and seconded that this resolution be adopted. Before putting the question I wish to say that any man

that values faithful service and cooperation in an organization of this kind must deeply appreciate the great services of our worthy director and president. Gentlemen, I will ask you to pass this resolution by a rising vote as a matter of respect for our worthy friend, Dr. Stratton.

(The delegates arose.)

Mr. GOODWIN. It is a unanimous vote.

The CHAIRMAN. Gentlemen, I appreciate very much this expression of gratitude. I can assure you that not only myself, but also my associates, look forward to this meeting as the principal event in the year in connection with weights and measures, and it is through this conference that we have been able to make the bureau a thousand times more useful than we could otherwise. On the other hand, as I have often said, we get just as much help from you as you get from us.

I appreciate the fact that you come from such long distances to go into these matters with the bureau and work with us hand in hand. I appreciate that much more than I can tell you. One thing that I have noted with great interest is that each meeting is better than the one before. Never before have we gotten down to business as at this one. So many men have come this time with definite things upon their minds. They have been in the field, and have been in contact with these various matters, and are ready to contribute their experience as well as to take advice. That is the object of the conference. It was formed particularly for that purpose, that we might make it a clearing house for the knowledge that you all possess, and that we might from year to year handle these things en masse, as it were. We get up a tentative specification. You all go back and use it, and it is the best thing for the time being. If experience throughout the year shows it is not the best thing you can change it, as you did this morning. That is the only way to keep up to date, the only way to be uniform, to promulgate regulations and matters of that kind that keep step with progress, because all of these things in relation to weighing devices and methods of using them are going to progress, and we must not get into a place where we can not take advantage of every new thing that comes along, and whenever we can change a thing for the better we are going to do it.

I thank you very much.

Mr. FRARY. The fourth resolution is as follows:

RESOLUTION OF APPRECIATION TO EXHIBITORS OF APPARATUS.

Whereas manufacturers of weighing and measuring instruments and dealers in equipment used by inspectors of weights and measures have, at no small expense, provided highly interesting and instructive displays of their products for examination by members of this conference: Therefore be it

Resolved, That the members of this conference hereby express to these manufacturers and dealers who have displayed their products here their appreciation of the educational advantages afforded by such exhibits.

(The resolution was duly adopted.)

Mr. FRARY. The fifth resolution is as follows:

RESOLUTION INDORSING PRINCIPLE OF NATIONAL SERIALIZATION OF TYPE OF APPARATUS.

Whereas since the wonderful development within the past decade of weighing and measuring devices makes it imperative that there be a centralized national

agency for the passing upon and approval of such devices before their manufacture and sale: Therefore be it

Resolved, That this Fourteenth Annual Conference of the Weights and Measures Officials of the United States respectfully urge the Members of Congress to act favorably upon legislation making provision for the national serialization of weighing and measuring devices.

(The resolution was duly adopted.)

Mr. FRARY. The sixth resolution is as follows:

RESOLUTION INDORSING PRINCIPLE OF STANDARDIZATION OF PACKAGES AND CONTAINERS.

Whereas modern commercial practices among manufacturers and distributors of foods in package form have given rise to the use of an ever-increasing number of forms, sizes, and shapes of original packages for foods; and

Whereas this condition results not only in confusion of dealers and consumers, but also permits of unfair commercial practices and results in deception of the consuming public: Therefore be it

Resolved, That this conference of weights and measures officials reaffirm its support of the principle of standardized crates, hampers, and baskets for fruits and vegetables.

(The motion was seconded.)

Mr. STEWART. I hope that the conference will take note that if we adopt this resolution many of us are voting for something that is contrary to what we have been working for heretofore and to the laws we have in the States. We are asking that there be a standard container, when the basis of our system in many of the States is weight, and not bulk. I certainly am not in favor of that sort of thing. I believe in the basis of weight.

The CHAIRMAN. The object of this resolution is to have as small a number of styles and sizes of packages as possible. The term "standardization" misleads in this sort of thing. I suggest that you use the word which is being used for this now, namely, "simplification." That is what you mean, is it not?

You would be surprised if you got all the sizes of any one article together. You will recall that the Secretary mentioned automobile tires. We have come across many cases of that kind, where a few sizes will answer the public just as well as a great many sizes. There is no limit suggested here. It merely expresses approval of the principle of reducing the number of sizes of packages to a minimum. It will make your work easier to have a fewer number of sizes.

Mr. FRARY. The resolution, with the proposed change, reads as follows:

RESOLUTION INDORSING PRINCIPLE OF SIMPLIFICATION OF PACKAGES AND CONTAINERS.

Whereas modern commercial practices among manufacturers and distributors of foods in package form have given rise to the use of an ever-increasing number of forms, sizes, and shapes of original packages for foods; and

Whereas this condition results not only in confusion of dealers and consumers, but also permits of unfair commercial practices and results in deception of the consuming public: Therefore be it

Resolved, That this conference of weights and measures officials reaffirm its support of the principle of simplified packages for foods and of simplified crates, hampers, and baskets for fruits and vegetables.

(The resolution was duly adopted.)

Mr. FRARY. The seventh resolution is as follows:

RESOLUTION IN RE PROPOSED LEGISLATION CONCERNING SLACK-FILLED PACKAGES.

Whereas the practice of incompletely filling packages of food is an all too prevalent trade practice: Therefore be it

Resolved, That this conference hereby express its support of H. R. 4981, commonly known as the "Slack-filled package bill," now pending in Congress, and respectfully urge favorable action by Congress upon this measure.

This is the measure that was passed by the House last session and died in the rush in the Senate at the last end of the session. It is the Haugen bill.

Mr. Holbrook, have you a copy of the bill that you can read?

Mr. HOLBROOK (reading):

[H. R. 4981.]

A BILL To amend an Act entitled "An Act for preventing the manufacture, sale, or transportation of adulterated or misbranded or poisonous or deleterious foods, drugs, medicines, and liquors, and for regulating traffic therein, and for other purposes," approved June 30, 1906, as amended.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section 8 of the Act entitled "An Act for preventing the manufacture, sale, or transportation of adulterated or misbranded or poisonous or deleterious foods, drugs, medicines, and liquors, and for regulating traffic therein, and for other purposes," approved June 30, 1906, as amended, is amended:

(a) By striking out the period at the end of paragraph "Second," in the case of food, and inserting in lieu thereof a semicolon, and adding thereafter the following clause: "or if it be in a container made, formed, or shaped so as to deceive or mislead the purchaser as to the quantity, quality, size, kind, or origin of the food contained therein."; and

(b) By adding at the end thereof a new paragraph to read as follows:

"Fifth. If in the package form and irrespective of whether or not the quantity of the contents be plainly and conspicuously marked on the outside of the package in terms of weight, measure, or numerical count, as provided in paragraph 'Third,' the package be not filled with the food it purports to contain."

SEC. 2. Such Act of June 30, 1906, as amended, is amended by adding to the end thereof a new section to read as follows:

"SEC. 14. That this Act may be cited as the 'Food and Drugs Act.'"

SEC. 3. (a) No fine, imprisonment, confiscation, refusal of admission or delivery, or other penalty shall be enforced for any violation of this amendatory Act occurring within six months after its passage.

(b) Any violation of such Act of June 30, 1906, as amended, occurring prior to or within six months after the passage of this amendatory Act, may be prosecuted, and the article of food or drug involved therein proceeded against in the same manner and with the same effect as if this amendatory Act had not been passed.

Inasmuch as the original act is not quoted I may state that this bill provides that under the conditions mentioned packages of food shall be deemed to be "misbranded" as this term is used in the original law.

Mr. REICHMANN. Does the amendment (b) suggested in the bill and marked "Fifth" mean that even if it were correctly marked the person would be liable?

Mr. HOLBROOK. That is the intent of the bill, because the marking in many cases considered objectionable is correct now, but the package is not filled and it is considered the purchaser may be deceived.

Mr. REICHMANN. How can there be any deception?

Mr. FRARY. The purchaser buys the goods by the package. If you see a large bulky package of macaroni on the shelf you take it for granted that the package contains more macaroni than the one beside it of smaller dimensions. But, as a matter of fact, it may contain no more than does the small package and it may be as correctly labeled. We know that the housewife does not read the labels as generally as we would like to have her read them. As a matter of fact, the custom objected to has grown up largely since the war. That is not wholly true, but it applies to many commodities sold in packages, especially to some forms of dry commodities, such as spices, macaroni, noodles, and similar commodities. It applies with regard to the deceptiveness of the package to a number of other articles. The practice has reached such dimensions that the legitimate industry, the honest dealers, have asked that it be taken care of by this provision. At the hearing in Congress it was brought out by those charged with the enforcement of the Food and Drugs Act, and was shown by a great mass of evidence, that many packages were incompletely filled, but they were all marked with the weight.

Mr. CUMMINGS. There is another instance of slack-filled packages that I can cite, namely, a number of bottles of flavoring extracts in panel bottles which have all the appearance of a 2-ounce bottle but hold only about three-quarters of an ounce. They were exempt from marking because of the fact that they did not hold 1 fluid ounce.

Mr. REICHMANN. It seems to me that the first part of that covers the whole situation. I do not see the object of the second.

Mr. HOLBROOK. I remember that in one of Dr. Alsberg's specific arguments in favor of this bill he referred to the shaker-top package of spices, which is not ordinarily opened by the housewife and is not such that it can be conveniently opened. She buys the package of pepper or other spice. It is already provided with a shaker top out of which she can shake the commodity. If she should open it to see whether it was full or not, she would destroy the purpose for which it was intended, namely, a convenient package.

Dr. Alsberg stated that formerly those packages had been regularly put up in 2-ounce sizes. The price of spices rose by leaps and bounds during the war, in the same way as a great many other commodities. He said the spice manufacturer did not change the size of the shaker-top package but instead put less and less commodity in it, until finally the 2-ounce package held, I believe, something like three-quarters of an ounce. The housewife used it until it was empty and then threw it away. At no time was it ever opened so that she could see what its condition was when she purchased it. I simply cite that, because Dr. Alsberg brought that out at the previous conference, and I thought it was well to put that illustration before you.

(The resolution was duly adopted.)

Mr. REICHMANN. As delegate from the State of Kentucky I want to record my vote in the negative, with the statement that the amendment suggested to section 5, in my judgment, is improper, a reflection upon honest merchants, and impracticable.

DISCUSSION AND MOTIONS IN RELATION TO METRIC SYSTEM.

Mr. FRARY. Mr. Chairman, I wish to explain that the next resolution is not introduced through the action of the entire committee on reso-

lutions. Mr. Webster, of New Hampshire, wishes it to be specifically stated that he is unalterably opposed to indorsing the adoption of the metric system as the universal system of weights and measures in the United States. Mr. Cummings also wishes to be recorded as opposed to the adoption of the resolution.

The other three members of the committee introduce this resolution relative to House bill No. 10, the Britten bill, which was put on our program to be discussed prior to the consideration of resolutions. Mr. Holbrook has a copy of the bill here. The resolution is as follows:

Whereas the enactment of House resolution No. 10, known as the Britten bill, will provide a simple, uniform, and easily intelligible system of weights and measures in the United States: Therefore be it

Resolved, That we indorse the Britten bill and urge early, favorable action thereon by Congress; and be it further

Resolved, That a copy of this resolution be forwarded to each Member of Congress.

Mr. REICHMANN. I am personally in sympathy with the general principle of the metric system, but it seems at this time to be impracticable to pass the Britten bill.

Mr. GOODWIN. There is no legislation which has ever been passed to prohibit any person or any firm or any State from using the metric system if they want to; but do you comprehend what it means to change from the present system to the metric system at this present age? Hundreds of millions and billions of money will be involved. This is no way to approach this subject. You must begin in your public schools and let future generations, after they have become educated on it, pass on the subject. We are not qualified.

Mr. STEWART. I do not believe that this is the place and time to bring that sort of a question before this conference—at the last session, when many of the delegates are gone. I would move you, sir, that this resolution lay on the table.

(The motion was seconded.)

Mr. RICHARDS. Mr. Chairman and gentlemen, there are some things that I have had the opportunity of finding out that maybe you have not; some things have gone and others are going, whether we like it or not. Take, for instance, the matter of counting. How many of you men want to go back to the Roman numerals? Not one. How many of you men would be willing to go back to pounds, shillings, and pence? As you go about over in London you find there is not a man who supports Herbert Spencer. Herbert Spencer said, "Money naturally divides itself into pounds, shillings, and pence." But every one of them says, "Poor old Herbert Spencer. There are some things he didn't know." In the first place, as I have traveled from country to country in my work, I have learned that we have got to use the meter as the fundamental standard, and we have got to use the millimeter, whether we like it or not.

I claim that the doing away with fractions of any kind is a good thing. This is of fundamental importance. Take, for instance, a dimensional drawing I had to make some time ago of a direct-current motor. You want to express a dimension that you formerly called five-sixteenths of an inch. If you call that 8 millimeters you put

down under "millimeters" the figure 8. This is much easier than to put down five-sixteenths of an inch. Now, you must get your area. Eight millimeters times 8 millimeters makes 64 square millimeters. Think about getting the square of five-sixteenths inch. As you go on with your calculations, even in the simplest kind of work, you find that hour after hour is saved if you use this system. It is a question of going on and working to educate the people. It is a matter of simple education, of showing to people that never realized it how the meter is divided into 100 centimeters, just as the dollar is divided into 100 cents.

If I have made a mistake, if I am wrong in any of these things, I want you to tell me. I am anxious to find out the truth about these things. So, in taking up so much of your time, I do it with this request, that whatever you do with this metric system resolution you tie up with this thought, that this is the thing for the country, this is the thing that is going to help America toward the front of the world, and this is the thing that we want to work together on.

I thank you.

The CHAIRMAN. There are one or two questions I want to ask. Do you think it is worth while for the countries of the world to try and come to an international system of weights and measures? That is, should we throughout the world have one system of weights and measures?

Mr. GOODWIN. When the proper time arrives, I should say "Yes."

The CHAIRMAN. You have admitted we ought to come to an international system of weights and measures. Do you think that we ought to take a system which has been worked out scientifically, is adapted for all kinds of measurements, is on a decimal basis, or should we attempt to take the English system and force that upon the world—a system which is not decimal and which has very few things to commend it as a system of weights and measures?

Gentlemen, there is not the slightest objection to putting this resolution on the table, but do it on the ground that you want to know more about it. Never shut yourselves up to the light. And one thing let me warn you about. When you hear these statements of the enormous cost, and so on, don't consider them. That is propaganda. It will cost something. It will cost a lot of inconvenience; but the people who go abroad soon learn the other system and think nothing of it.

Let me tell you one thing that explodes all this idea of millions of dollars of costs. The two great locomotive works in this country began 8 or 10 years ago to build locomotives in the metric system. When the first locomotive drawing came over here, the first order from a metric country, they took that drawing and started to change it over into our own system. One of the workmen, a foreman, said, "Why not build it in that system?" The superintendent said, "Well, we will try it," and they called the foremen and workmen together, they got a few rules, and gave them a few lessons. Then they went to work and they built that first order by the metric system. There was no cost, there was no expensive machinery, nothing was changed except the measuring instruments given to the workmen, and you can measure with one as well as the other. What was the result? They have been building them ever since in the metric system whenever an

order comes that way, and I have heard the head of the plant say that the workmen like it better; that they make fewer mistakes and have no trouble.

That absolutely explodes this idea of the great cost that is claimed to be attached to the introduction of the system. There is, of course, a greater cost in some cases than in others. Why saddle on to the future a system of weights and measures which is not suitable for all purposes? It has just grown up. It is not a logical system. While we may not want to favor the adoption of the metric system to-day or to-morrow, we ought never to go on record in the light of progress.

Mr. STEWART. I want this particular resolution tabled, but I want to follow that with another motion to the effect that this question be brought up at our next conference not later than the second day's session for consideration.

(The question was taken and the motion was agreed to.)

Mr. STEWART. Now, Mr. President, I want to make a motion that this question be taken up not later than the second day's session of the next annual conference.

(The motion was seconded, the question was taken, and the motion was agreed to.)

REPORT OF COMMITTEE ON NOMINATIONS, PRESENTED BY WM. F. CLUETT, CHAIRMAN, AND ELECTION OF OFFICERS.

Your committee on nominations desires to recommend the adoption at this time of the rule that future nominating committees follow the rule of rotation in the office of vice presidents.

We respectfully submit to this conference the names of the following members to act as officers and members of the executive committee for the ensuing year:

President, S. W. Stratton; first vice president, W. T. White; second vice president, H. A. Webster; secretary, L. A. Fischer; treasurer, Frank Wanser; members of the executive committee, all of the officers, ex officio, R. F. Barron, A. F. Bove, W. F. Cluett, H. N. Davis, S. C. Dinsmore, T. F. Egan, G. G. Frary, D. F. Frazier, A. A. Greer, D. C. Hill, J. J. Holwell, T. L. Irvine, W. B. McGrady, Francis Meredith, I. L. Miller, J. M. Mote, F. E. Rowland, W. F. Steinel, G. B. Stewart, Leo Stuhr, and John Umpstead.

(Signed) WM. F. CLUETT.
AUGUSTUS W. SCHWARTZ.
JOHN M. MOTE.
H. N. DAVIS.
B. FRANK RINN.

Mr. REICHMANN. I move the adoption of the report, and that the secretary be instructed to cast one ballot for the election of all the nominations as read.

(The motion was seconded, the question was taken, and the motion was agreed to.)

The CHAIRMAN. The report of the committee on nominations is adopted, and the officers and members of the executive committee therein named are declared duly elected.

DISCUSSION OF APPLICATION OF RETROACTIVE SPECIFICATIONS FOR LIQUID-MEASURING DEVICES.

Mr. Townsend (representing Guarantee Liquid Measure Co.). Mr. Chairman, there is a matter to which the manufacturers are giving a considerable amount of thought. It is the question of retroaction in connection with the specifications that have been adopted by the conference. There are certain specifications which were adopted which are supposed to be retroactive in the field. That is to say, if an equipment already installed in the field does not now comply with specifications which have been adopted the sealer is to condemn that particular piece of equipment, although it may have been installed and accepted by the sealer one, two, three, or five years ago.

Our objection, giving my own opinion, which I think is that of the industry, is that this is a very dangerous custom to establish. We necessarily comply with your specifications. Your committee on specifications and tolerances represents, perhaps, the best talent that can be found, and we have no objection to their action. But we can not look into the future and say what a committee may do in the way of drawing new specifications five years from now, and the industry is placed in this position: We may make and install to-day a machine which would absolutely comply with your specifications, but through progress or for some other reason there would be found the necessity for changing them, and if a new specification is made retroactive the manufacturing industry will never know where they are at.

Capital is necessary for progress and necessary to industry, but I think that capital will be very slow to invest in manufacturing enterprises if they never know whether their equipment in the field will stay in or whether they will be put to much expense to change it. That is the thing on which I would like to have an expression from the conference.

The Chairman. Before you sit down, have you any specific cases in mind, any specific illustrations? Certainly the manufacturer ought to have a reasonable amount of time in which to make a change. I know that our committee has always considered that, and as we go ahead and as we change specifications some reasonable period ought to be allowed, depending on the nature of the changes. It may be that some drastic change ought to have a longer time than others.

Mr. Townsend. No; I have no particular instance in mind, sir. But, nevertheless, the opportunity is there, as we see it, squarely under your specifications. We might have a piece of machinery condemned that has been there for 10 years. It is not so much the particular specifications which have been made retroactive as it is the precedent which I fear.

The Chairman. Will not this be handled properly if the makers are present and have a chance to consider the different proposed changes in the specifications? If some change is proposed for compliance with which a year or some other definite period ought to be allowed, will not the people concerned see it at the time?

Mr. Townsend. But at the time when the change is made a new situation is created, and it may affect a piece of machinery which has already been sold with a fixed overhead. It leaves matters in a very unsettled condition.

Mr. Holbrook. As I understand Mr. Townsend's remarks, he is not objecting to anything which has occurred in the past, but he fears something which might conceivably occur in the future.

As the present chairman of the committee on specifications and tolerances, I may state that it is the opinion of the committee that after specifications are adopted for the first time upon a class of apparatus such as liquid-measuring devices, any amendments to old specifications, or any new specifications which are thereafter adopted, should in general be made nonretroactive, and that will be the policy of the present committee. As to binding future committees or future conferences, I do not know that it can be done. A motion might be introduced this year to the effect that future specifications should not be retroactive and next year's conference might change the motion and make a motion that they should be so.

It seems to me that the only way out of the matter is if this committee attempts to violate this expression of policy made to-day, or if a future committee does not abide by that expression, that the conference, as a whole at that time should state that any specification adopted should be nonretroactive. But every year, I take it, when these matters will be discussed, the manufacturers will be here to urge upon the present committee or the committee which may exist in the future when they think any action of the committee and of the conference should be nonretroactive and it can be considered upon its merits at that time.

Last year the conference adopted a resolution to the effect that the specifications and tolerances should be considered by the committee and should be made retroactive or nonretroactive as the committee deemed best. That was right at that time, I think, because the subject was practically being discussed for the first time and a first set of specifications was being adopted. The committee met the manufacturers' representatives at the end of the conference and discussed all the problems with them, and so far as I know, both the conference and the manufacturers were satisfied at the conclusions reached.

As to the future I can not say except that I will repeat that the present committee feels that new specifications or amendments to old specifications adopted in the future, in relation to liquid-measuring devices, for instance—a class of apparatus which has already been handled by the conference—should be made nonretroactive unless there were very urgent reasons for doing otherwise.

Mr. Townsend. I should like to say this: That immediately after the conference last year I took occasion to write a letter to each member of the committee in relation to the subject of retroaction. My personal opinion about it is this: I am in thorough sympathy with the object that they want to accomplish in making new specifications retroactive. I believe you have in your specifications one which says that no device shall be installed or used which will facilitate the perpetration of fraud. I think under the common law you have full protection without making a single one of these retroactive.

For instance, you find that a certain device would defraud the public. You condemn it, and if the condemnation is contested any court will uphold it. In making these specifications retroactive there is an element of uncertainty that enters into the industry itself which

is dangerous from the manufacturers' standpoint and, I think, in the long run from the public standpoint, because we manufacturers must have certainty if we are going to follow the advice of this conference and progress. We must have capital, and we can not invest capital, nor can we spend capital, on an uncertain basis.

Mr. Holbrook. Mr. Townsend, if a committee of the conference made a specification which was declaratory of the common law, since the common law, as we all know, is retroactive why should not the specification be retroactive?

Mr. Stewart. As I understand it, a specification that we adopt here to-day applies to new installations and installations that are returned to the factory for repair, but it does not apply to that which is now installed. We are not to go back home and because a unit does not comply with the new specifications hang a red tag on it and demand that it be changed immediately.

Mr. Holbrook. In my opinion, any specification in the present set of specifications which condemns a piece of apparatus because it facilitates the perpetration of fraud should certainly be retroactive.

Mr. Ramsdell. I think the industry is very much pleased at the treatment it has received at the hands of the bureau and the conference. What we are concerned about is the vast amount of equipment that is now in the field in the hands of our customers. It has been built with the best of intentions. All the skill and ability we have have been thrown into it. You gentlemen have not appeared in it until recently. We are anxious, and more than anxious, to cooperate with you in every way, shape, and manner to see that the public gets every last drop that they are entitled to. I think that the industry is determined to assist in every way possible in building its equipment in accordance with your requirements.

What we are concerned about are the hundreds of thousands of pumps now in the field, running into millions and millions of dollars, as to which it is possible some of your specifications might be made to apply in a retroactive manner. If there is anything that has been built with the deliberate intention to defraud the public, I think Mr. Townsend will agree with me that it ought to be condemned.

Mr. Townsend. Yes.

The Chairman. I think the matter is straightened out. If any pumps have been installed that will defraud the public you want them removed just as we do?

Mr. Ramsdell. We certainly do.

The Chairman. Furthermore, it is a very good plan at each conference when we meet from year to year to bring up definite instances, if there are such, where injustice has been worked. If there are any such, let us have them.

Mr. Ramsdell. The competition in our industry in the past has been sufficiently sharp to influence us to our best efforts. I think your own records will show that we have met with a fair measure of success. If the rulings that are made here to-day or later should be made to apply to equipment that is already in the field, I do not know how we could meet the situation. It would cost us millions of dollars and cost our customers millions of dollars. I am not speaking in defense of anything that is wrong. If there is anything that is wrong, we want to know about it.

The CHAIRMAN. Are you not rather anticipating? I think if you find a good case of that kind and bring it up you can trust to the good sense of these people.

Mr. RAMSDELL. I have no doubt of it.

Mr. GOODWIN. I am here to-day on a specific errand. My object in being sent here was to prevent the fraudulent use of gasoline-measuring devices. I want to be put on record, if you please, that Rhode Island, although she is the smallest State in the Union, is the pioneer in advancing the subject of the correction of a liquid-measuring device so that it can not function when there is danger of fraud. I have an inexpensive device to accomplish this based on the vacuum principle. It can be attached below the pump chamber and will determine whether there is leakage or not. Looking at it anyone can see by the action of the liquid whether conditions are right or wrong.

Mr. SCHWARTZ. I suggest it be turned over to the committee on specifications and tolerances for presentation at the next conference.

AMENDMENT OF LIQUID-MEASURING DEVICE SPECIFICATION NO. 5.[15]

Mr. BARRON. There was one small point in the specifications for liquid-measuring devices that I would have liked to have brought up this morning, but I did not get an opportunity. In No. 5 we have a phrase—

> Provided, however, That a device may be constructed to deliver other amounts than the above, corresponding to predetermined prices at a definite price per gallon, but in such cases the device shall be so constructed that the price per gallon at which it is set at any time must be clearly indicated to the customer by automatic means.

So far no satisfactory automatic means has been discovered. It was found that a glass door was unsatisfactory, because the interior of the pump is dark, the glass easily broken, and dangerous. We believe that a sign placed on a pump will show every customer what he is getting, will not require him to get down and turn on a flash-light, and will enable the sealer to see the point at which the pump is set. So I would move to amend specification No. 5 by inserting after the word "customer" in the last line the word "either," and after the word "means" the words "or by means of a sign conspicuously displayed on the device."

(The motion was seconded, the question was taken, and the motion was agreed to.)

MOTION IN RE AMENDMENT TO MODEL LAW,[16] AND OTHER MOTIONS.

Mr. HOLBROOK. Mr. Chairman, may I make a motion at this time to the effect that the secretary of the conference be instructed to draft a section of the model law in conformance with the new bread law to be included in the place of the present section on bread in the model law? We have a model law on the subject of weights and

[15] The text of the specifications and tolerances for liquid-measuring devices as amended by the conference will be found in Appendix I, p. 123.

[16] The section authorized herein will be found in Appendix III, p. 131.

measures which was passed at a preceding annual conference. In that model law there is a section relative to bread.

That section is to the effect that bread should be marked with the net weight. The conference has now gone on record in favor of standardizing the loaf. The model law and the model bread law just adopted are at variance, and the motion was to the effect that the secretary prepare a section which will put the present bread standards in the model law, so that the model law will, when reprinted, be complete in itself. The section will be shorter than the model bread law adopted this year, because the penalty section and enforcement provisions are included in the general sections relating to these subjects.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. SCHWARTZ. At this time I would like to make a motion that a committee of the bureau secure a basket of fruit and some flowers and send them to Mr. Fischer, with the compliments of the conference, the bill to be paid by the treasurer of the conference.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. NEALE. I would like, if I may at this time, to express the gratitude of the manufacturers who were given opportunity by the Bureau of Standards to exhibit their weighing and measuring devices before this conference, and particularly to go on record as thanking Mr. Dutton, your delegated agent, who took care of us so well and carefully, supplying our every need. I think that every one of the companies exhibiting at the conference join heartily in that statement.

Mr. HILL. I would like to make a motion that the executive committee, in fixing the date for the next conference, consider the change of date to June in place of the month of May. For one thing, the excursion rates on the railroads go into effect on the 1st of June, which would be of benefit to the people in the South, such as in Texas and Oklahoma. Then, many of the elections in the South are held in April, the officials taking office on the 1st of May, so that it gives the new incoming officers in the city no time to make preparations to attend the conference. Also, as to the time that we should devote to the meetings. I believe it would be a good idea, since we have plenty of work, to put in another day. You know we come so far, and it takes about two weeks for us, and for the men who live near it spoils a week. Why not put in five days' work in place of four and give us more time to discuss these things.

Mr. SIREN. I second that motion, because I think if we held it in June we would have a good many more southern States attending.

The CHAIRMAN. You have heard the motion, which has been seconded.

(The question was taken, and the motion was agreed to.)

The CHAIRMAN. It is understood that the executive committee is to consider this suggestion in making their program.

Mr. SCHWARTZ. It was suggested this morning that the secretary of the conference was to send out notices to the delegates present that an assessment of $1 was required to replenish the treasury. I do not know whether that was passed or not.

Mr. STEWART. I make a motion to that effect.

(The motion was seconded, the question was taken, and the motion was agreed to.)

The CHAIRMAN. A motion to adjourn is in order.

Mr. REICHMANN. I make the motion that we adjourn.

(The motion was seconded.)

The CHAIRMAN. Before adjourning I want to thank you gentlemen for coming so far and taking so much of an interest in this meeting. It has been better than ever, a fact that is a source of great satisfaction to us all. I thank you, very much.

(The question was taken, and the motion was agreed to.)

The CHAIRMAN. The meeting is adjourned.

(Thereupon, at 3.50 o'clock p. m., Thursday, May 26, the Fourteenth Annual Conference on Weights and Measures of the United States adjourned.)

APPENDIXES.

APPENDIX I.—SPECIFICATIONS AND TOLERANCES FOR LIQUID-MEASURING DEVICES (AS AMENDED BY THE FOURTEENTH ANNUAL CONFERENCE).

FOREWORD.

At the Thirteenth Annual Conference on Weights and Measures, held in May, 1920, specifications and tolerances for liquid-measuring devices were adopted. These specifications were divided into three classes: First, the specifications or portions of specifications intended to be retroactive; second, those specifications or portions thereof intended to be nonretroactive; third, those specifications or portions thereof limited to take effect July 1, 1921, and thereafter to be nonretroactive.

For an explanation of the terms used above the following paragraphs are quoted from the former specifications and tolerances adopted by the conference.

CLASSIFICATION OF SPECIFICATIONS.—The following specifications * * * shall be divided into two sets, the first to be retroactive and to apply to all apparatus immediately upon adoption of the specifications, the second to apply only to new apparatus.

For the purpose of administration the following classes of apparatus are established:

Class 1. * * * devices which, after the promulgation of these specifications, are manufactured in the State or brought into the State.

Class 2. * * * devices which are in the State at the time of promulgation of these specifications, either in use or in the stock of manufacturers of or dealers in such apparatus.

All the specifications shall apply to apparatus of class 1.

The specifications printed in italics shall not apply to apparatus of class 2, and therefore shall not be retroactive.

Since the special limitation placed upon certain specifications as explained above was to be automatically withdrawn on July 1, 1921, the limitation on the application of such specifications is not shown herein, and this copy is therefore effective as of July 1, 1921.

This copy of the specifications and tolerances on liquid-measuring devices contains all of the amendments made by the Fourteenth Annual Conference held in May, 1921, and also includes a requirement in reference to the type of pointer to be used in connection with graduated scales having nonparallel lines, which the committee on specifications and tolerances was directed by the conference to draft and incorporate herein.

The attention of delegates and manufacturers is directed to the fact that the committee on specifications and tolerances always holds itself ready to take up and consider arguments presented by anyone interested, whether these are directed to the necessity of new specifications or to the amendment of old specifications. While the committee is, of course, without power to make changes in the specifica-

tions and tolerances as adopted by the conference, nevertheless, if the reasons advanced in the manner indicated appear to be sound or the objections well taken additions or amendments to take care of the matter will be prepared and included in the report of the committee to the next conference. In so far as it is found possible the committee will also interpret the specifications or answer questions concerning them. Communications along these lines should be sent to F. S. Holbrook, committee on specifications and tolerances of the annual conference, whose address is Bureau of Standards, Washington, D. C., for transmittal to members of the committee.

Respectfully submitted.

(Signed) F. S. Holbrook,
William F. Cluett,
W. T. White,
Committee on Specifications and Tolerances, Annual Conference.

SPECIFICATIONS.

No. 1. Definition.—A mechanically operated liquid-measuring device, hereinafter referred to as a liquid-measuring device, is a mechanism or machine adapted to measure and deliver liquid by volume. Such a device often consists of a pump or a pump in combination with other mechanism.

No. 2. Permanence.—*Liquid-measuring devices shall be of such design, construction, and materials that they may reasonably be expected to withstand ordinary usage without impairment of the accuracy of their measurement, or the correct functioning of their operating or indicating parts.*

No. 3. Plumb and Level Conditions.—*All liquid-measuring devices shall be so designed and constructed that they will be in normal operating position when they are in level. All liquid-measuring devices shall be installed plumb and level, and their installation shall be of such strength and rigidity as to maintain this condition.*

No. 4. Means Required to Determine Level.—*Liquid-measuring devices, the indications or deliveries of which are changed by an amount greater than one-half the tolerance allowed, when set in any position on a surface making an angle of 5 per cent or approximately 3 degrees with the horizontal, shall be equipped with suitable means by which the level can be determined and established, such as a two-way or a circular level, a plumb bob, leveling lugs, etc.*

No. 5. Units of Delivery.—*Liquid-measuring devices shall have the following discharge capacities per stroke or cycle, and these only: One gallon; a multiple of the gallon; 2½ gallons; or a binary submultiple of the gallon, that is, the quantity obtained by dividing the gallon by the number 2 or a power of the number 2: Provided, however, That a device may be constructed to deliver other amounts than the above, corresponding to predetermined values at a definite price per gallon, but in such cases the device shall be so constructed that the price per gallon at which it is set at any time must be clearly indicated to the customer either by automatic means or by means of a sign conspicuously displayed on the device.*

No. 6. Indication of Delivery Required.—All liquid-measuring devices shall be so designed and constructed that the amount de-

livered will be clearly and definitely indicated by automatic means, and the indication of any delivery shall take place only when the full discharge has in fact occurred: Provided, however, That the requirement that the full discharge shall have been completed before registration shall not apply to the dribble flow caused by the displacement of a piston rod during the return of a piston to its initial position, *when a clear statement conspicuous to the customer and adjacent to the indicating means is placed on the liquid-measuring device to the effect that the full amount can not be delivered until the piston or the pointer or indicator has been returned to its initial position.*

No. 7. Sensitiveness.—*All liquid-measuring devices shall be so designed and constructed that they can readily be operated to deliver each quantity for which a graduation, stop, overflow pipe, or other indicating means is provided within the tolerance on such amount hereinafter provided.*

This specification shall be construed to require that in the case of all devices which have a graduated scale or dial or similar indicating means as the sole means of determining the amount of liquid discharged, the length on the scale or dial equivalent to the tolerance at any graduation must be readily appreciable when the character of the indicating element and its normal distance from and position in reference to the observer's eye are taken into consideration, and in no case shall this length be less than 0.04 inch. For example, if a device is designed and constructed so that (1) 1 gallon is the first graduation; (2) there is no stop, overflow pipe, or other automatic means of terminating the delivery; (3) the graduations are equally spaced; and (4) if the cross section of the measuring chamber is the same throughout its length, the minimum length on the scale or dial shall be 3.1 inches per measured gallon, the maximum cross sectional area of the measuring chamber shall be 75 square inches, and if cylindrical, the maximum diameter must be 9.75 inches.

Note.—The second paragraph of the above specification was adopted tentatively only. For the conference interpretation of the word "tentative" see text of resolution adopted by the conference and incorporated under "General notes" at the end of these specifications and tolerances. The values given in this spcification have been refigured to conform to the new tolerances adopted by the Fourteenth Annual Conference.

No. 8. Constancy of Delivery.—The amounts delivered by any liquid-measuring device shall not vary from the standard by more than the tolerances hereinafter provided, irrespective of the speed at which the apparatus is operated and, subject to the conditions of the special test described below, irrespective of the time elapsing between operations: Provided, however, That when a liquid-measuring device is operated faster than normal speed of operation the tolerance shall be applied in deficiency only—that is, the liquid-measuring device shall not be deemed to be incorrect by reason of the tolerance in excess being exceeded during such operation.

For the purpose of test the condition of the device shall be such that a period of nonuse of one hour shall not result in an error of the first delivery of the device after such period of nonuse greater than the tolerance allowable on the smallest amount which the device is designed to deliver, and a period of nonuse of six hours shall not result in an error of the first delivery of the device after

such period of nonuse greater than 10 cubic inches, or, in the case of a new liquid-measuring device, 5 cubic inches.

NOTE.—In the special elapsed-time test described above allowance shall be made for errors due solely to a change in volume of the contained liquid, resulting from temperature variations alone, since an error of this character is unavoidable in the case of volumetric measurements of this kind when the apparatus is standing unused. This change in volume due to temperature variations is, however, small in amount for all ordinary variations of temperature, amounting in the case of gasoline to about 0.7 per cent for each 10° Fahrenheit change of temperature, or about 1.3 per cent for each 10° Centigrade change of temperature.

In applying the six-hour test it is recommended that the delivery be not made through a hose, since the amount of gasoline necessary to wet the inside of the hose will cause an additional shortage in the delivery.

No. 9. INDICATING AND REGISTERING PARTS.—Counters and graduated scales and dials used on liquid-measuring devices to tally sales and deliveries to individual purchasers or to indicate the amount delivered when any portion of the cycle or stroke has been completed shall be of such size and style and shall be so located and disposed that they are clearly visible to and readable by the customer from any position which he may reasonably be expected to assume. The graduations shall be of such character and arrangement that the major ones *are more prominent than and* are clearly distinguishable from the minor ones. *In all types of liquid-measuring devices which have a graduated scale which at some point or points or at all points constitutes the sole or most sensitive means of determining the amount of liquid discharged, the width of the graduation marks shall not exceed 0.04 inch.*

No. 10.[17] POINTERS AND IDICATFRS.—All pointers and indicators which when used in conjunction with a graduated scale or dial indicate the amount of liquid discharged or the value of the delivery at a predetermined price per unit of volume shall be so shaped that a correct and accurate reading is given. *Pointers and indicators are required to be symmetrical about the graduation lines at which they may stand:* [*Provided, however, That in the case of pointers and indicators used in connection with vertical scales having nonparellel graduation lines and in respect to the nonhorizontal lines on such scales, this requirement shall be waived if the pointers and indicators are so designed and constructed that, as the pointer or indicator approaches the correct indicating position in respect to any graduation line, only such portion of such graduation line as has not yet been reached by the index of the pointer or indicator or by a horizontal line extended from the end thereof shall be exposed to view and all other portions of such graduation line shall be automatically obscured.*] *Pointers and indicators, which when used in conjunction with a graduated scale or dial, constitute at some point or points or at all points the sole or most sensitive means of determining the amount of liquid discharged or the value of the delivery at a predetermined price per unit of volume, shall reach to the finest graduation marks, and the width of the pointer or indicator, or of the end thereof, shall not be greater than the width of such marks.*

[17] It is recommended by the committee that that portion of the specification inclosed in brackets be not put into effect until ratified by the conference.

No. 11. PARALLAX.—*All liquid-measuring devices in which the accuracy of the readings of any indicating mechanism is affected by parallax shall be so designed and constructed as to reduce the errors due to this cause to a minimum.*

No. 12. GRADUATED SCALES TO BE SECURED.—When a liquid-measuring device is provided with a graduated scale or dial, this scale shall be riveted to its supports or otherwise permanently fixed in position: Provided, however, That in the case of liquid-measuring devices of the gage-glass type a sliding scale will be permitted when the displacement of such scale is, by suitable means, automatically prevented at all times when liquid is being discharged from the delivery outlet.

No. 13. NUMBERING OF GRADUATIONS.—*Figures defining the value of graduations shall be uniformly placed in reference to the graduation marks and shall be as close thereto as practicable, but shall not be so placed as to interfere with the accuracy of reading. Such figures shall be in regular sequence; that is, sequences such as 5, 1, 2, 3, 4 shall not be permitted.*

No. 14. SCALES IN OPPOSITE DIRECTIONS PROHIBITED.—The use on a liquid-measuring device of two graduated scales reading in opposite directions and referable to the same indicating means shall not be permitted.

No. 15. LETTERING, GRADUATIONS.—*All markings, instructions, figures, and graduations required under these specifications shall be of such size, design, material, and location and shall be so applied or affixed that they will not tend easily to become obliterated or illegible.*

No. 16. RETURN OF INDICATING ELEMENT TO ZERO.—All liquid-measuring devices shall be so designed and constructed that the indicating element used in tallying deliveries to individual purchasers is returnable readily to a definite and clear zero reading before the next delivery is begun.

No. 17. STOPS TO BE POSITIVE.—*When the stops or other stroke-limiting devices on a liquid-measuring device are subject to direct pressure or impact in the operation of the device such stops shall be of such construction that the permanence and security of their positions is provided for by a positive, nonfrictional engagement of the parts whose relative motions are to be prevented. Such stops shall be so designed and constructed that adjustment within the prescribed tolerances can be made.*

No. 18. STOP MECHANISM TO BE DEFINITELY POSITIONED.—All liquid-measuring devices designed to deliver two or more different predetermined amounts by bringing into operation different stops or other means of defining the delivery shall be so designed and constructed that the position for the proper setting of each stop is definitely and accurately defined, inadvertent displacement from this position is obstructed, and the delivery for which the device is set at any time is clearly and conspicuously indicated.

No. 19. PROVISION FOR SEALING.—*All devices adapted to be altered for adjusting or correcting the delivery of a liquid-measuring device shall be of such construction that they can be sealed, either separately or together, in such a manner that the position of none of them can be changed without destroying the seal or seals: Provided, however, That this shall not apply to such devices as alter the deliveries to conform to different prices per gallon on such a liquid-measuring device as is described in the proviso of specification No. 5.*

No. 20. Use of Adjustments.—No adjustments of the delivery of a defined-stroke liquid-measuring device shall be permitted, except that intended to produce a piston displacement per cycle of 231 cubic inches per indicated gallon of delivery. Adjustments of piston displacement to correct for leaks, slippage, excessive length of pipe line, or other defects of the installation shall not be permitted.

No. 21. Diversion of Measured Liquid.—All liquid-measuring devices shall be so designed and constructed that no portion of the measured liquid can be diverted from the one discharge outlet through which delivery is being made or to be made during the operation of the liquid-measuring device.

This specification is to be constructed to require that there shall be no means provided by which any of the measured liquid can be diverted from the measuring chamber or the discharge line to the supply tank or elsewhere during the period of operation, and that all valves in the supply line intended to prevent the reversal of flow of the liquid shall be of such design and construction that their closure is automatically effected in the use of the device. Also when two or more discharge outlets for the liquid are provided all outlets except the one in use must automatically be tightly and completely closed off during the period of discharge, and the closure shall be so effected that delivery made through one discharge outlet shall not affect the subsequent delivery through any other discharge outlet: Provided, however, That the above shall not apply to the drain outlet from the filtering chamber when such outlet is in plain view of the customer.

No. 22. Shut-Off Valves in Discharge Line.—No liquid-measuring device shall be equipped with a shut-off valve at the extremity of the hose or elsewhere in the hose line except in the case of devices designed and constructed so that they must be operated with the hose full of liquid at all times. In case such valve is used, any other valve in any portion of the discharge line leading to this outlet must be so designed and constructed that it can only be closed off by the use of some tool or device which is outside of and entirely separate from the measuring device itself, such as a wrench, screw driver, etc., but not an adjusting pin.

This specification is not to be construed as allowing a shut-off valve in the hose in the case of devices in which the hose or any part thereof can be drained of liquid after the actual mechanical operation of the mechanism of the liquid-measuring device is discontinued in any way, except as follows: (1) By means of the mechanically operated valve, or (2) by delivering from the measuring device more than the full measuring capacity thereof during the actual mechanical operation of the mechanism thereof.

No. 23. Drainage of Discharge Line.—All liquid-measuring devices shall be so constructed and installed that they will provide for the complete and rapid drainage, to a definite and uniform level, of the liquid contained in the hose or outlet pipe, and will not permit a siphoning or a continuous trickle of liquid from the discharge outlet after the operation of the mechanism is discontinued.

This specification will be construed to require that if hose is used its inlet end shall be at least 5 feet above the normal level upon which the receiving vehicle or vessel stands, and the liquid-measuring de-

vice shall be equipped with an automatic vacuum breaker or equivalent means to insure the complete and rapid drainage of the hose, that is required by the above. The hose shall be properly reinforced and shall be of such length and stiffness that no movable portion thereof will be readily disposed in such a way as to tend to retain liquid after the operation of the device is completed. Provided, however, That this specification shall not be construed to apply to devices which, under the terms of specification No. 22, may be equipped with two shut-off valves or cocks and are to be operated with the hose full of liquid at all times.

No. 24. Limiting Height of Suction Lift.—No defined-stroke piston-type, liquid-measuring device shall be so installed as to work under a total suction head sufficient to cause vaporization of the liquid for which it is used under the highest temperature and lowest barometric pressure likely to occur.

No. 25. Use Limited to Certain Liquids.—*Liquid-measuring devices which will not give correct results except when used with liquids having particular properties—as, for example, high viscosity—shall be conspicuously, clearly, and permanently marked to indicate this limitation. Such wording may take the form, "Not suitable for gasoline or light oils," "Use only for molasses or heavy oils," or "For viscous liquids only."*

No. 26. Computing Charts.—*The value graduations on all computing charts used on liquid-measuring devices shall not exceed 1 cent at all prices per gallon up to and including 30 cents. At any higher price per gallon the value graduation shall not exceed 2 cents: Provided, however, That nothing in the above shall be construed to prevent the placing of a special value graduation to represent each 5-cent interval. These special graduations may take the form of dots, staggered graduations, or similar forms. They shall be so placed that their meaning and value may be clearly understood, but they shall not be placed in the space between the regular graduations. And provided further, That nothing in the above shall be construed to prevent the omission of all value graduations from a clear interval between the zero graduation and any subsequent graduation.*

No. 27. Fraudulent Construction Prohibited.—All liquid-measuring devices and all devices designed to be attached thereto and used in connection therewith shall be of such construction that they are not designed to and may not be used to facilitate the perpetration of fraud.

No. 28. Metric System.—No specification contained in the preceding pages shall be understood or construed to prohibit the sale or use of liquid-measuring devices constructed or graduated in units of the metric system.

The tolerance to be allowed on any liquid-measuring device constructed or graduated in units of the metric system shall be the same as those specified on similar apparatus of an equivalent size or at an equivalent capacity in the customary system.

TOLERANCES.

Except on special tests described above, the tolerances to be allowed in excess or deficiency on all liquid-measuring devices shall not be

greater than the values shown in the following table: Provided, however, That the manufacturers' tolerances, or the tolerances on all new liquid-measuring devices, shall not be greater than one-half of the values given: And provided further, That these latter tolerances shall also be applied to all devices which are being retested after being found incorrect and subsequently adjusted or repaired.

Delivery.	Tolerance.	Delivery.	Tolerance.
	Cubic inches.		*Cubic inches.*
½ gallon or less	2.0	6 gallons	8.0
1 gallon	3.0	7 gallons	9.0
2 gallons	4.0	8 gallons	10.0
3 gallons	5.0	9 gallons	11.0
4 gallons	6.0	10 gallons	12.0
5 gallons	7.0		

For deliveries of over 10 gallons add 1 cubic inch per indicated gallon.

GENERAL NOTES.[18]

Conflict of Laws and Regulations.—In the above specifications certain items appear which may conflict in certain jurisdictions with present State or local laws or ordinances or regulations of State or local fire marshals or boards of safety. In such cases of conflict an attempt should be made by the weights and measures officials to harmonize the two codes and, in the meanwhile, it may be found necessary to suspend the enforcement of such specifications.

Device to Indicate Exhaustion of Liquid Supply.—The conference goes on record to the effect that it is its opinion that such a device as is mentioned in the following paragraph is a highly necessary one, and the conference gives notice that it is probable that at some future time, when it becomes apparent that there are devices on the market which will accomplish the desired purpose, an effort will be made to incorporate the following paragraph in the specifications:

All liquid-measuring devices, the accuracy of delivery of which is affected by the lowering of the liquid in the supply tank to a point at or near the intake end of the suction pipe, shall be provided with a device which will make the pump inoperable during the continuance of this condition, or shall be so constructed as to warn the purchaser and the operator in a conspicuous and distinct manner that the level of the liquid supply is so low as to endanger the accuracy of the measurement.

Resolution Adopted Defining the Word "Tentative."—Whereas a doubt exists as to the proper interpretation and meaning of the word "tentative" or "provisional"; and

Whereas it is the desire of the conference that said word or words be defined: Now, therefore, be it

Resolved, That the words "tentative" and "provisional" shall be considered as synonymous, with the construction and interpretation as follows, for the purpose of the conference: The words "tentative" and "provisional," as used by the conference, shall mean such contemplated use or usages to be complied with when possible, but in no sense shall they be mandatory, obligatory, or enforcible.

[18] This material was incorporated in the Thirteenth Annual Conference.

APPENDIX II.—MODEL BREAD LAW ADOPTED BY THE FOURTEENTH ANNUAL CONFERENCE.

SECTION 1. That the standard loaf of bread shall weigh one pound, avoirdupois weight. All loaves of bread manufactured, procured, or kept for the purpose of sale, offered, or exposed for sale, or sold, in the form of loaves, shall be of one of the following standard weights and no other, namely, one pound, one-half pound, one and one-half pounds, or multiples of one pound, avoirdupois weight: *Provided, however*, That the provisions of this act shall not apply to biscuits, buns, crackers, rolls, or to what is commonly known as "stale bread," and sold as such, provided the seller shall at the time of sale expressly state to the buyer that the bread so sold is "stale" bread. When twin or multiple loaves are baked, the weights specified in this act shall apply to each unit of the twin or multiple loaf.

SEC. 2. That the [insert title of enforcing officer] shall enforce the provisions of this act. Rules and regulations for the enforcement of the provisions of this act not inconsistent therewith shall be made by the [insert title of enforcing officer], and such rules and regulations shall include reasonable variations and tolerances, in excess and deficiency, which may be allowed.

SEC. 3. That it shall be unlawful for any person to manufacture, procure, or keep for the purpose of sale, offer or expose for sale, or sell bread in the form of loaves which is not of one of the weights specified in section 1, within such variations and tolerances as may be fixed by the [insert title of enforcing officer]. Any person who, by himself or by his servant, or agent, or as the servant or agent of another shall violate any of the provisions of this act shall be guilty of a misdemeanor, and shall be punished by a fine of not less than $25 nor more than $200 upon a first conviction in any court of competent jurisdiction, and upon a second or subsequent conviction in any court of competent jurisdiction he shall be punished by a fine of not less than $50 nor more than $500, or by imprisonment for not more than six months, or by both such fine and imprisonment, in the discretion of the court.

SEC. 4. The word "person," as used in this act, shall be construed to import both the plural and the singular, as the case demands, and shall include corporations, companies, societies, and associations.

APPENDIX III.—REVISED SECTION ON BREAD TO BE SUBSTITUTED FOR BREAD SECTION FORMERLY INCLUDED IN MODEL STATE LAW ON WEIGHTS AND MEASURES.

[To be numbered Sec. 26 in Form No. 2, Sec. 18 in Form No. 1, and Sec. 24 in Form No. 3.]

The standard loaf of bread shall weigh one pound, avoirdupois weight. All bread manufactured, procured, made, or kept for the purpose of sale, offered or exposed for sale, or sold, in the form of loaves, shall be of one of the following standard weights and no other, namely, one pound, one-half pound, one and one-half pounds, or multiples of one pound, avoirdupois weight: *Provided, however*, That rules and regulations for the enforcement of the provisions of this section not inconsistent herewith, shall be made by the Superin-